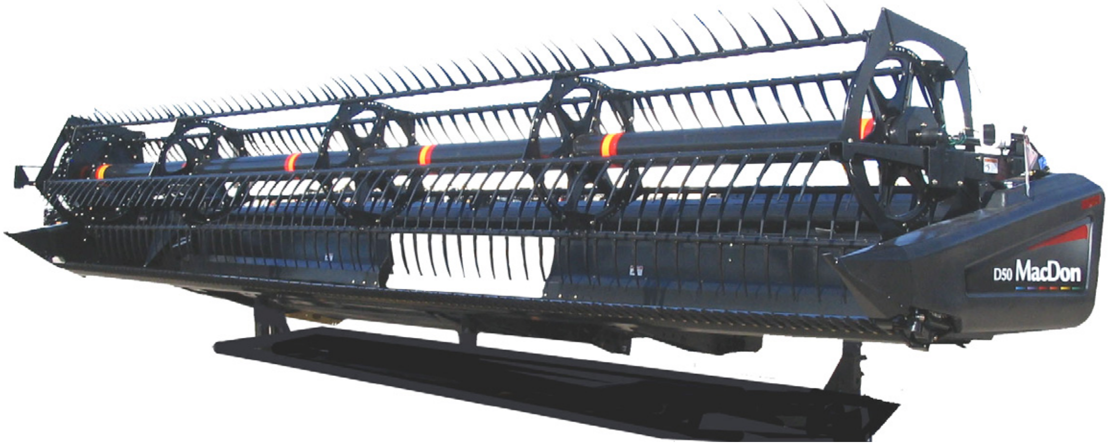
D50 and D60 Harvest Headers®
For Self-Propelled Windrowers

OPERATOR'S MANUAL

Revision B

Part #169441 $15

This Manual contains instructions for "SAFETY", "OPERATION", and "MAINTENANCE/SERVICE" information for your new MacDon Models D50 and D60 Harvest Header® for self-propelled windrowers.



D50 HARVEST HEADER®



D60 HARVEST HEADER®

1 INTRODUCTION

This instructional manual contains operating and maintenance information on the MacDon D50/D60 Harvest Headers. They are designed to serve a dual function in your grain, hay, and specialty crop harvesting operation. Teamed with your self-propelled windrower power unit and optional hay conditioner, the D50 and D60 Harvest Headers will cut and lay crop into uniform fluffy windrows.

Windrowing allows starting the harvest earlier, protects the cop from wind damage, and gives you more flexibility in scheduling combine time.

CAREFULLY READ ALL THE MATERIAL PROVIDED BEFORE ATTEMPTING TO UNLOAD, ASSEMBLE, OR USE THE MACHINE.

Use this manual as your first source of information about the machine. If you follow the instructions given here, your Header will work well for many years.

If you require more detailed service information, a Service Manual is available from your MacDon Dealer.

Use the Table of Contents and the Index to guide you to specific areas. Study the Table of Contents to familiarize yourself with how the material is organized.

This manual must be used in conjunction with your Self-Propelled Windrower Operator's Manual.

Keep this manual handy for frequent reference and to pass on to new Operators or Owners.

A storage case for this manual is located inside the header left endshield.

Call your MacDon Dealer if you need assistance, information, or additional copies of this manual.

Published: October 2010

2 MODEL AND SERIAL NUMBER

NOTE: Right hand (RH) and Left-hand (LH) designations are determined from the Operator's position, facing forward.

Record the Model Number, Serial Number and Model Year of the Header, and Slow Speed Transport/Stabilizer Wheel Option (if installed), on the lines below:

HEADER MODEL___________SERIAL NUMBER________________YEAR______

Serial Number Plate is located on the left hand endsheet, near the knife drive motor.



SLOW SPEED TRANSPORT/STABILIZER WHEEL OPTION

SERIAL NUMBER__________________YEAR______

Serial Number Plate is located on the left hand wheel pivot tube.



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3 SAFETY

3.1 SAFETY ALERT SYMBOL



This safety alert symbol indicates important safety messages in this manual and on safety signs on the machine.

This symbol means:

- ATTENTION!
- BECOME ALERT!
- YOUR SAFETY IS INVOLVED!

Carefully read and follow the safety message accompanying this symbol.

WHY IS SAFETY IMPORTANT TO YOU?

- ACCIDENTS DISABLE AND KILL.
- ACCIDENTS COST.
- ACCIDENTS CAN BE AVOIDED.

3.2 SIGNAL WORDS

Note the use of the signal words DANGER, WARNING, and CAUTION with safety messages. The appropriate signal word for each message has been selected using the following guidelines:

DANGER

Indicates an imminently hazardous situation that if not avoided, will result in death or serious injury.

WARNING

Indicates a potentially hazardous situation that if not avoided, could result in death or serious injury. It is also used to alert against unsafe practices.

CAUTION

Indicates a potentially hazardous situation that if not avoided, may result in minor or moderate injury. It is also used as a reminder of good safety practices.

3.3 SAFETY SIGNS

- The safety signs appear on the header at the locations shown in the Section 3.3.2.
- Keep safety signs clean and legible at all times.
- Replace safety signs that are missing or become illegible.
- If original parts on which a safety sign was installed are replaced, be sure the repair part also bears the current safety sign.
- Safety signs are available from your MacDon Dealer Parts Department.

3.3.1 SAFETY SIGN INSTALLATION

a. Be sure the installation area is clean and dry.

b. Decide on the exact location before you remove the decal backing paper.

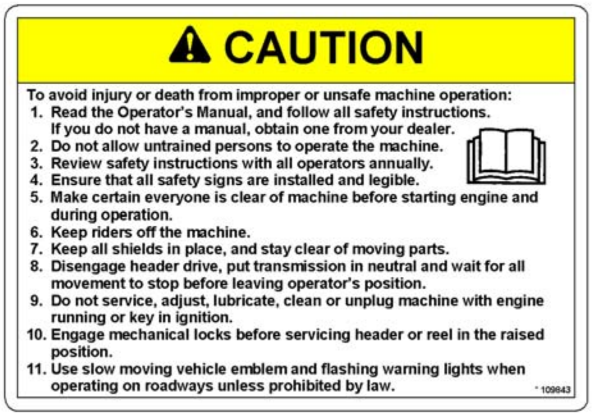
c. Remove the smaller portion of the split backing paper.

d. Place the decal in position and slowly peel back the remaining paper, smoothing the decal as it is applied.

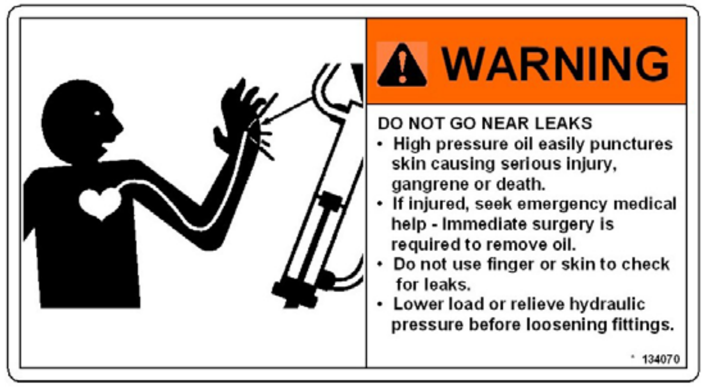
e. Small air pockets can be smoothed out or pricked with a pin.

3.3.2 SAFETY SIGN LOCATIONS

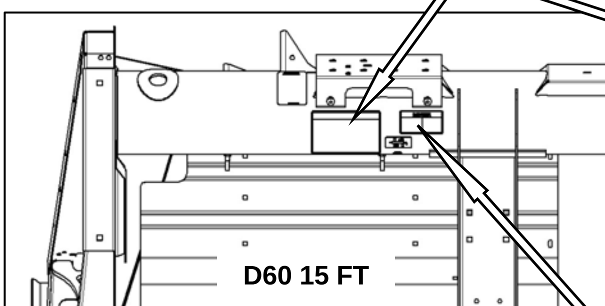
3.3.2.1 3-Panel Safety Signs - North America

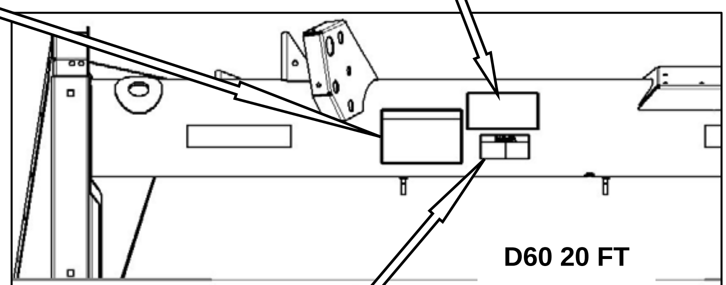


BACK TUBE - BOTH ENDS #109843



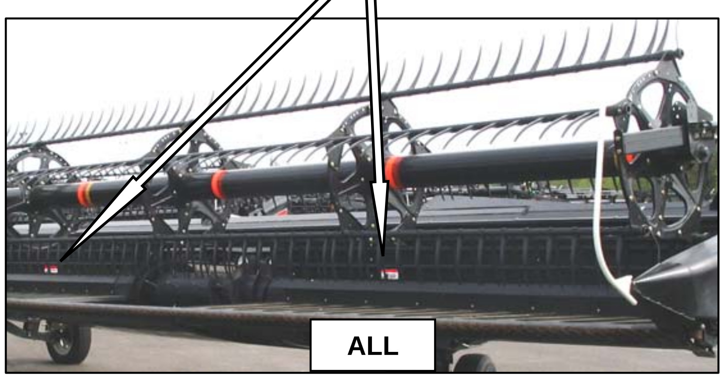
BACK TUBE #134070



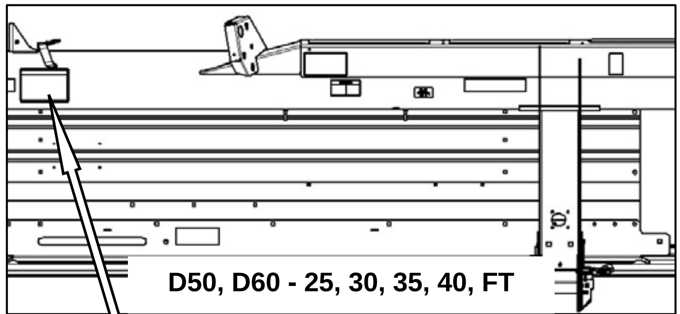


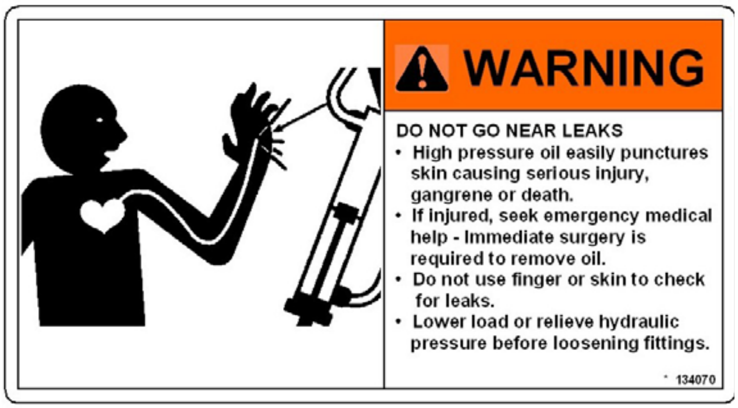


BACK TUBE & DECKS - BOTH ENDS #172147

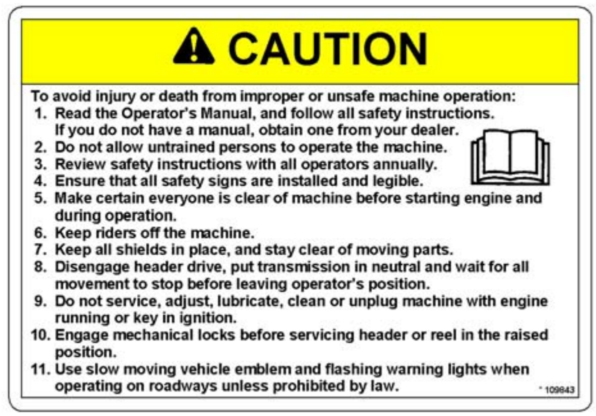


3-Panel Safety Signs - North America (Cont'd)

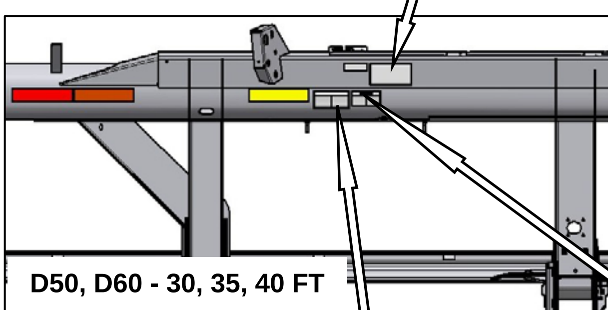


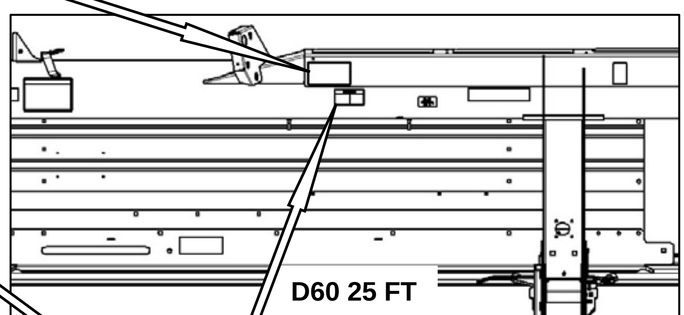


BACK TUBE #134070



BACK TUBE - BOTH ENDS #109843





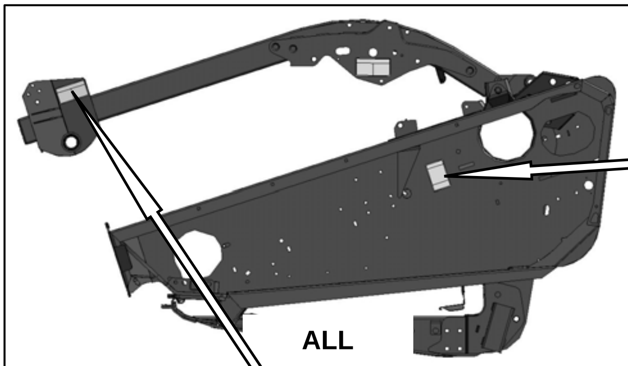


BACK TUBE - DOUBLE REEL ONLY
#42122



BACK TUBE BOTH ENDS
#172147

3-Panel Safety Signs - North America (Cont'd)

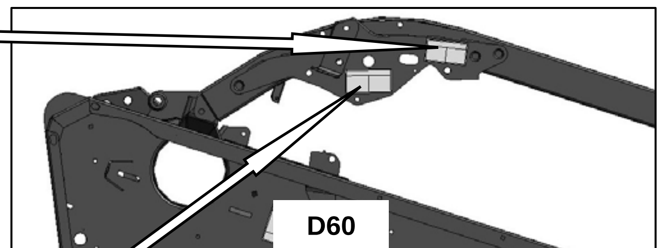




BOTH ENDS - DOUBLE KNIFE
LEFT END - SINGLE KNIFE
#142909

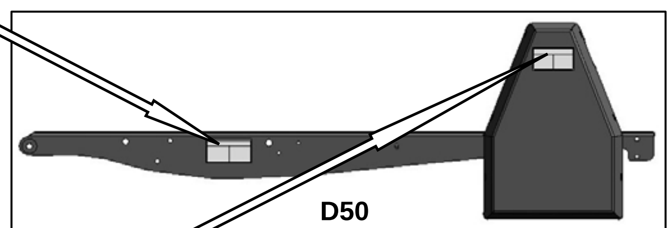


LH & RH REEL ARMS
#174633



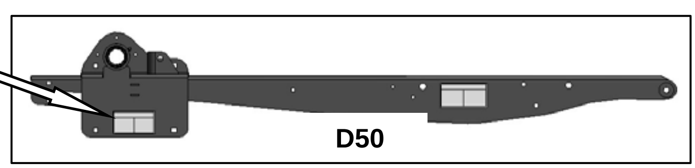


LH & RH REEL ARM
#42122

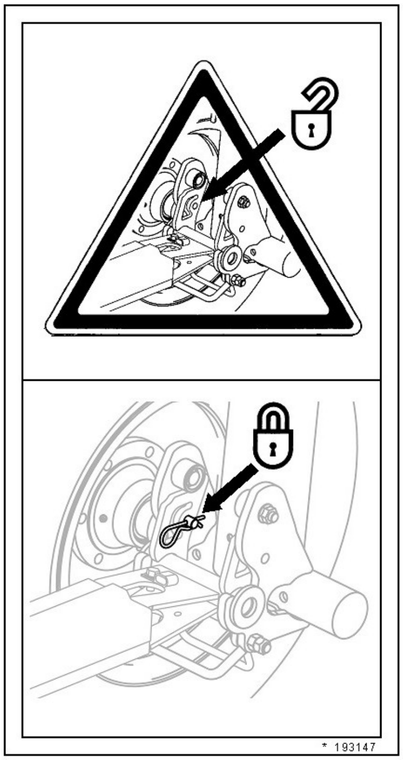




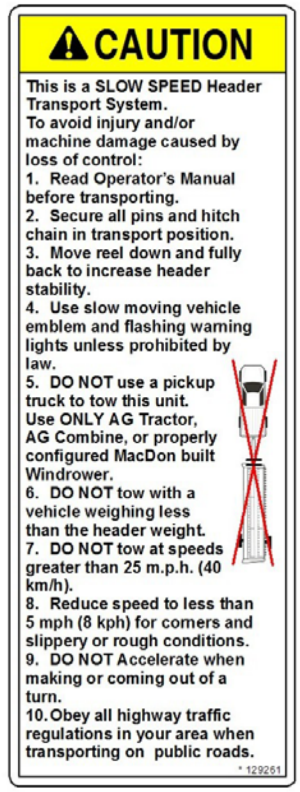
REEL ARMS
#174633



3.3.2.2 2-Panel Safety Signs - North America and Export



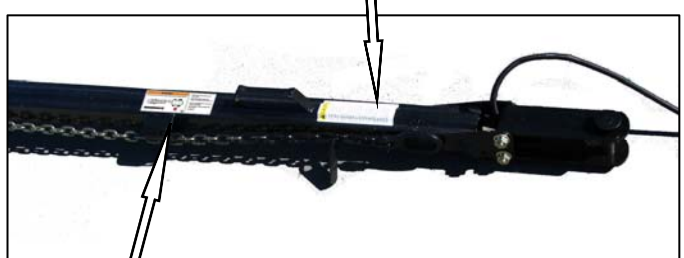
FRONT TRANSPORT LEG
#193147

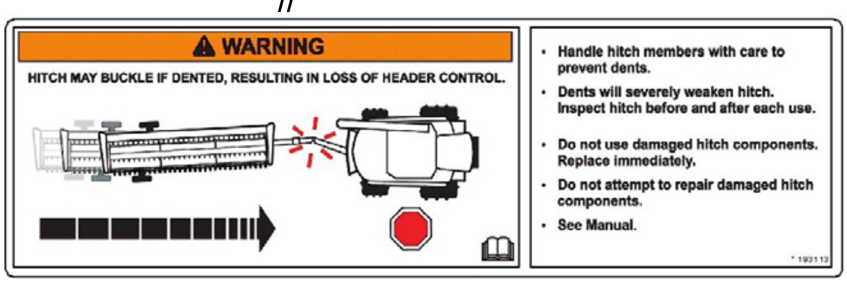


TOW-BAR
#129261



D50/D60 - 25, 30, 35 FT, D60 - 40 FT



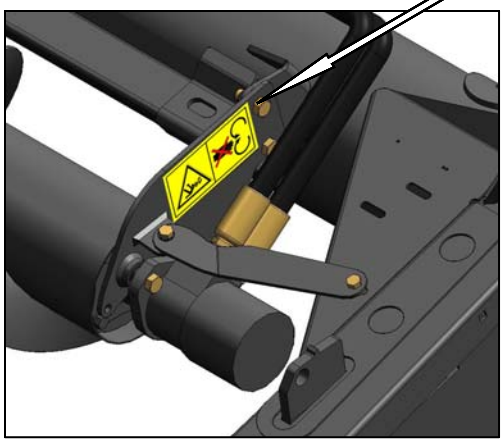


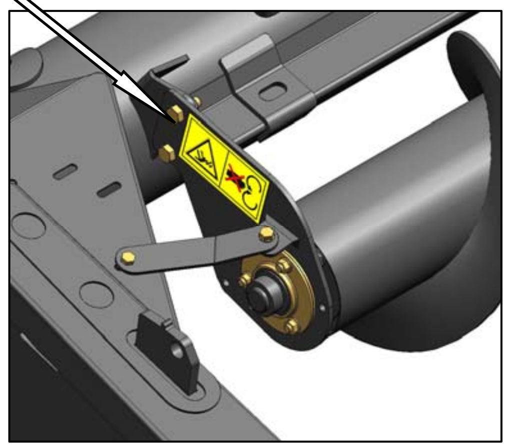
TOW-BAR
#193113

2-Panel Safety Signs - North America and Export (Cont'd)

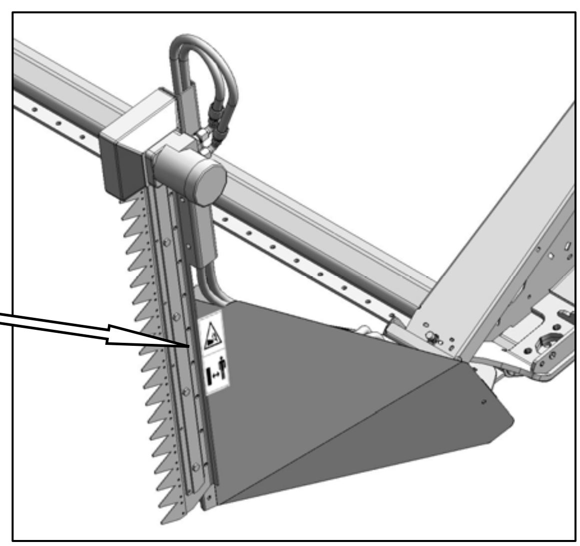


UPPER CROSS AUGER #174682



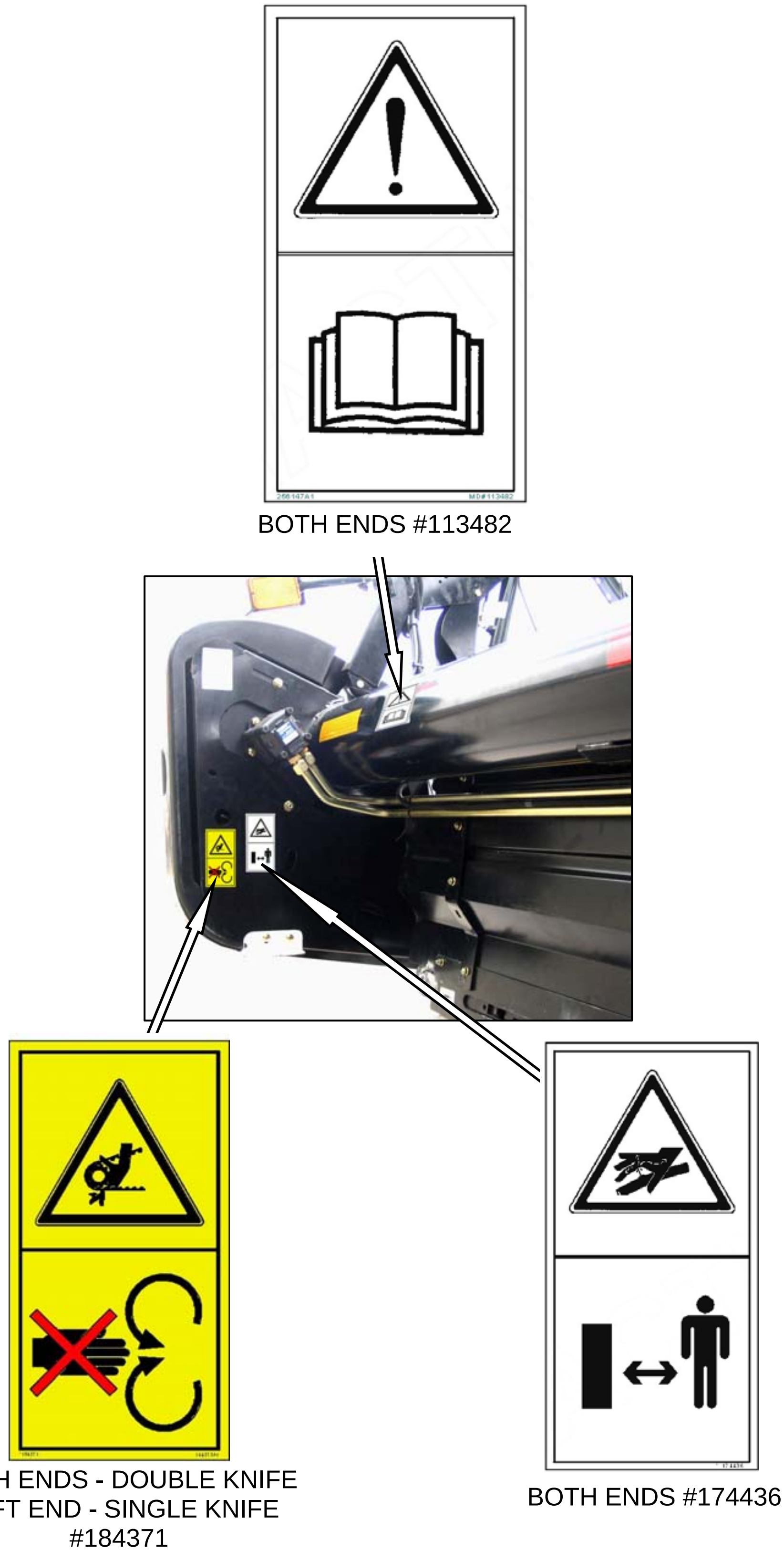




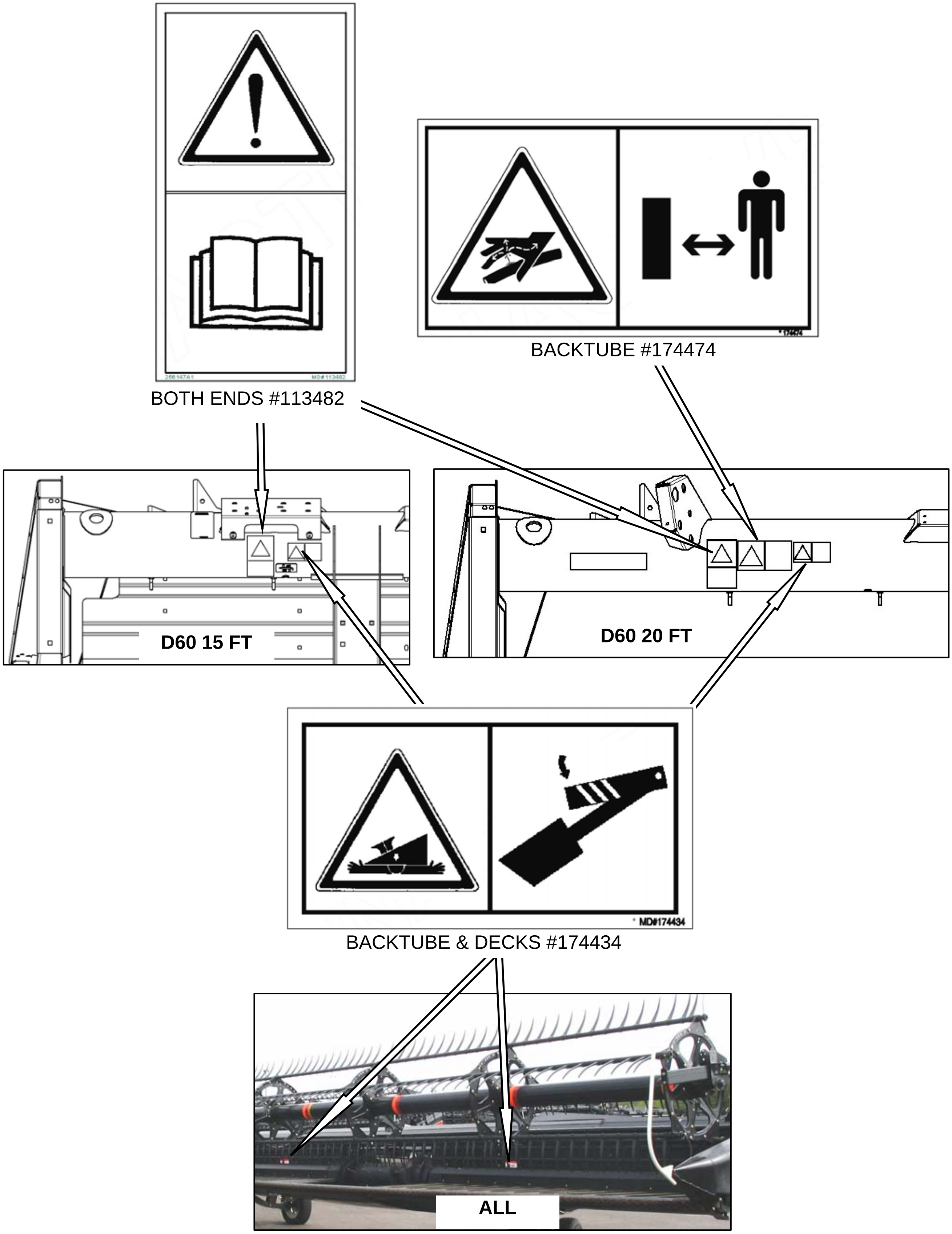


LH & RH VERTICAL KNIFE
#174684

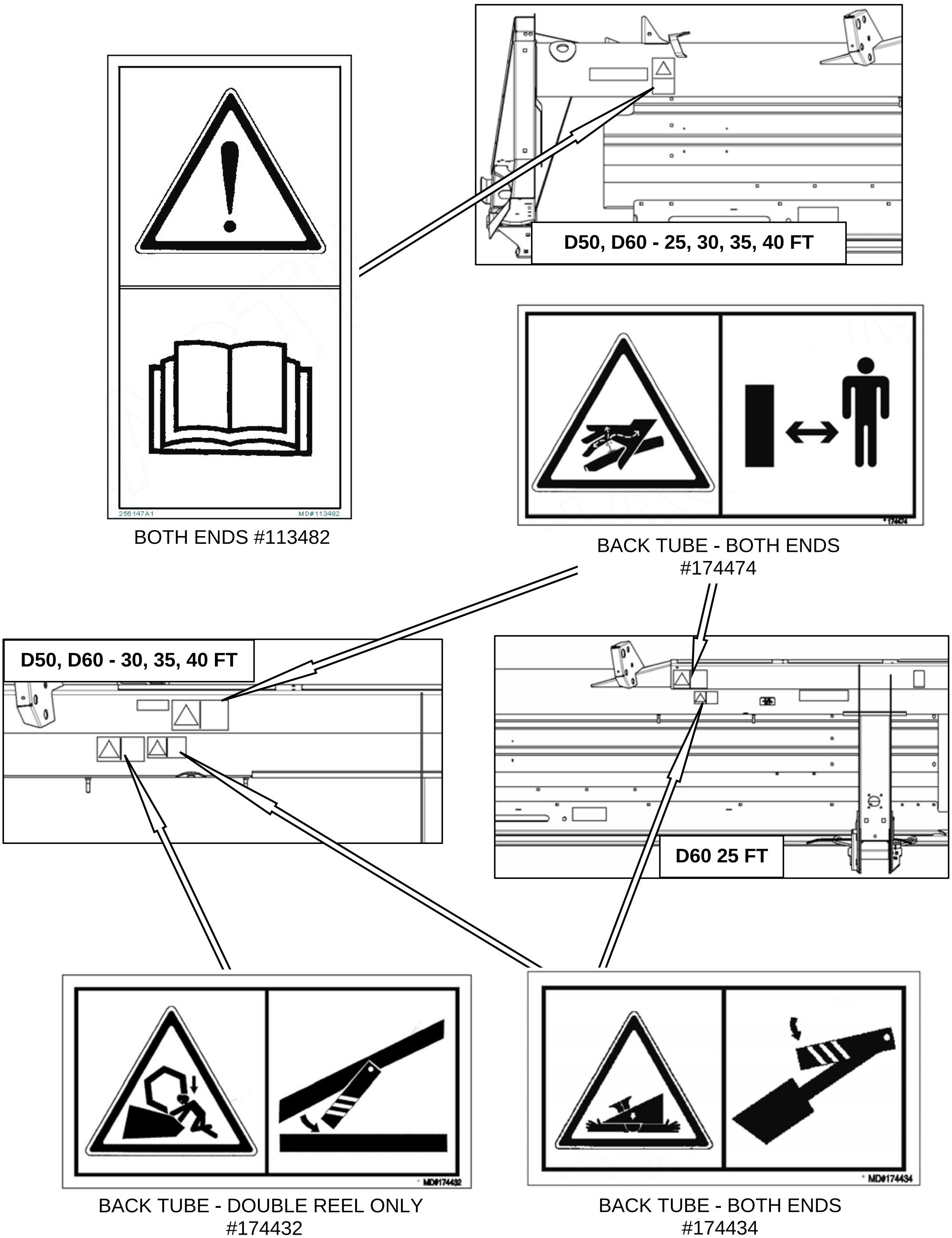
2-Panel Safety Signs - North America and Export (Cont'd)



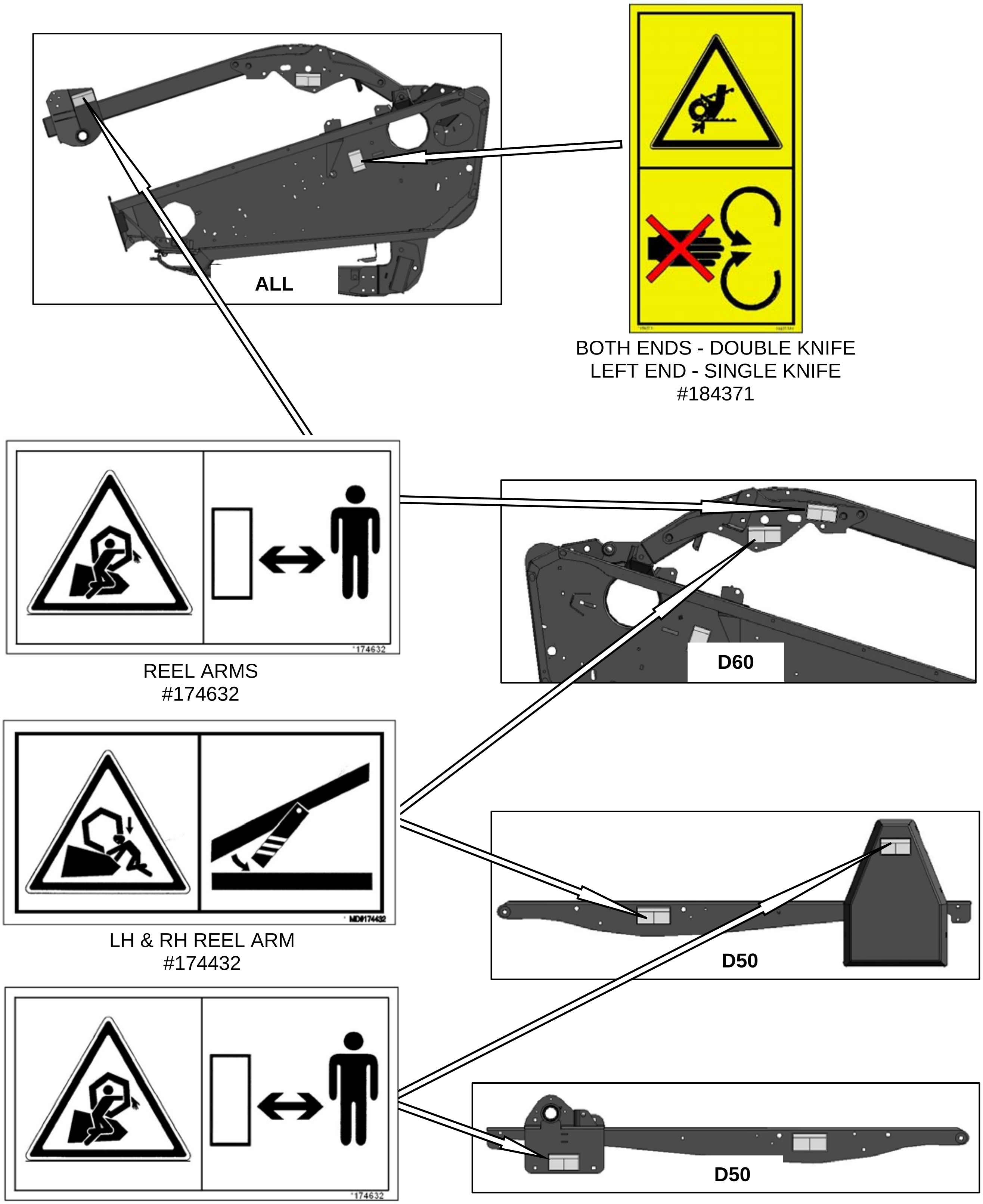
3.3.2.3 2-Panel Safety Signs - Export



2-Panel Safety Signs – Export (Cont'd)



2-Panel Safety Signs - Export (Cont'd)



BOTH ENDS - DOUBLE KNIFE
LEFT END - SINGLE KNIFE
#184371

REEL ARMS
#174632

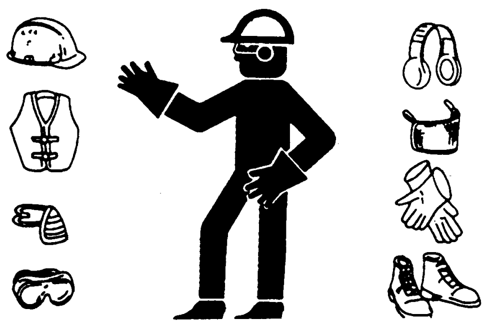
LH & RH REEL ARM
#174432

REEL ARMS
#174632

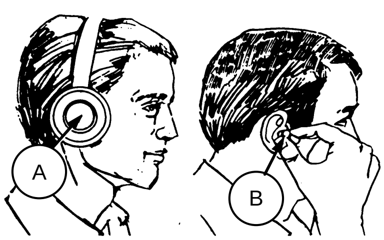
3.4 GENERAL SAFETY

CAUTION

- **The following are general farm safety precautions that should be part of your operating procedure for all types of machinery.**
- **Protect yourself. When assembling, operating and servicing machinery, wear all the protective clothing and personal safety devices that COULD be necessary for the job at hand. Don't take chances.**
- **You may need:**



  - **a hard hat.**
  - **protective shoes with slip resistant soles.**
  - **protective glasses or goggles.**
  - **heavy gloves.**
  - **wet weather gear.**
  - **respirator or filter mask.**



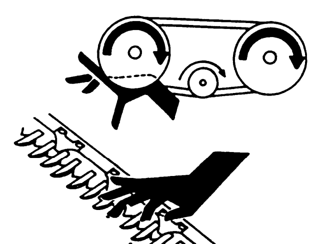
  - **hearing protection. Be aware that prolonged exposure to loud noise can cause impairment or loss of hearing. Wearing a suitable hearing protective device such as ear muffs (A) or ear plugs (B) protects against objectionable or loud noises.**



- **Provide a first-aid kit for use in case of emergencies.**
- **Keep a fire extinguisher on the machine. Be sure the extinguisher is properly maintained and be familiar with its proper use.**
- **Keep young children away from machinery at all times.**
- **Be aware that accidents often happen when the Operator is tired or in a hurry to get finished. Take the time to consider the safest way. Never ignore warning signs of fatigue.**
- **Wear close-fitting clothing and cover long hair. Never wear dangling items such as scarves or bracelets.**



- **Keep hands, feet, clothing and hair away from moving parts. Never attempt to clear obstructions or objects from a machine while the engine is running.**



- **Keep all shields in place. Never alter or remove safety equipment. Make sure driveline guards can rotate independently of the shaft and can telescope freely.**

- **Use only service and repair parts made or approved by the equipment manufacturer. Substituted parts may not meet strength, design, or safety requirements.**
- **Do not modify the machine. Unauthorized modifications may impair the function and/or safety and affect machine life.**
- **Stop engine, and remove key from ignition before leaving Operator's seat for any reason. A child or even a pet could engage an idling machine.**

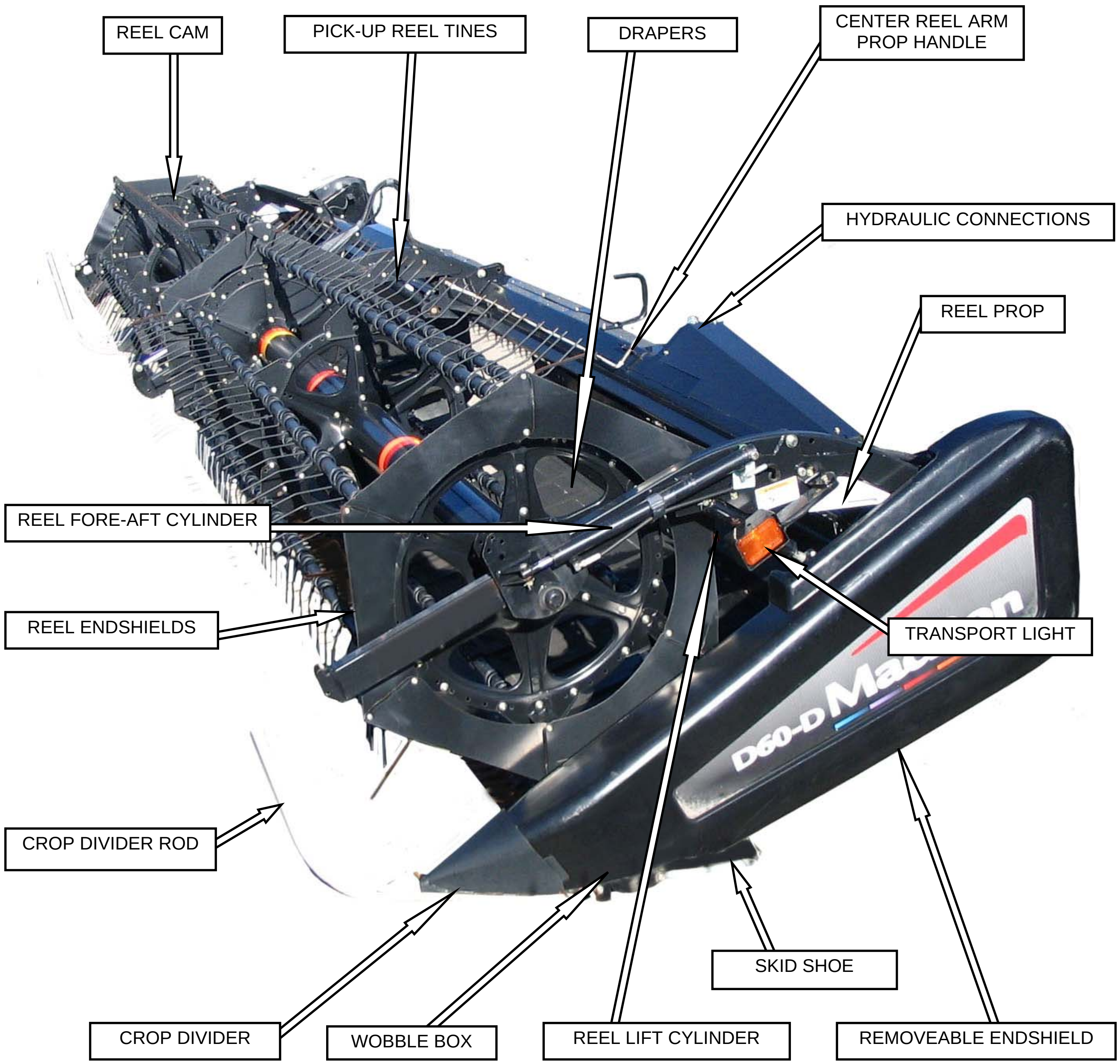


- **Keep the area used for servicing machinery clean and dry. Wet or oily floors are slippery. Wet spots can be dangerous when working with electrical equipment. Be sure all electrical outlets and tools are properly grounded.**
- **Use adequate light for the job at hand.**
- **Keep machinery clean. Straw and chaff on a hot engine are a fire hazard. Do not allow oil or grease to accumulate on service platforms, ladders or controls. Clean machines before storage.**
- **Never use gasoline, naphtha or any volatile material for cleaning purposes. These materials may be toxic and/or flammable.**
- **When storing machinery, cover sharp or extending components to prevent injury from accidental contact.**

4 DEFINITIONS

TERM	DEFINITION
API	American Petroleum Institute
ASTM	American Society of Testing And Materials
Cab-Forward	Windrower operation with the operator and cab facing in the direction of travel
CDM	Cab Display Module
DWA	Double Windrow Attachment
Engine-Forward	Windrower operation with the Operator and engine facing in the direction of travel
ISC	Integrated Speed Control
N-DETENT	The slot opposite the neutral position on operator’s console
rpm	Revolutions per minute
SAE	Society Of Automotive Engineers
WCM	Windrower Control Module
Windrower	Windrower with header attached
Windrower Tractor	Power unit only. (Windrower without the header attached)

5 COMPONENT IDENTIFICATION



6 SPECIFICATIONS

		HEADER MODEL	D60		D50/D60			D60
		HEADER SIZE	**15 FT.**	**20 FT.**	**25 FT.**	**30 FT.**	**35 FT.**	**40 FT.**
OVERALL								
Width (Inches (mm))	Transport (Reel Full Aft) With CA20 Adapter		96 (2438)					
	Field			255.1 (6479)	315.1 (8003)	375.1 (9527)	435.1 (11051)	495.1 (12575)
Length (Inches (mm))	Transport (with Tow Pole)		Not Applicable			505.7 (12845)	547.5 (13907)	601.5 (15278)
Height - Transport			97 in. (2464 mm)					
Estimated Weight Range Base Header (lb (kg))		D50	Not Applicable		3500 (1589)	4150 (1884)	4700 (2134)	Not Applicable
		D60	3000 (1362)	3400 (1544)	3500 - 4100 (1589 - 1861)	4200 - 5100 (1907-2315)	4700 - 5700 (2134 - 2588)	5400 - 5800 (2451 - 2633)
CUTTERBAR								
Width Inches (mm)			180 (4572)	240 (6096)	300 (7620)	360 (9144)	420 (10668)	480 (12192)
Header Cutting Height	Shortest Center-Link		1.3 in. (32 mm) below ground - 52.3 in. (1328 mm) above			0.8 in. (20 mm) below ground - 52.8 in. (1340 mm) above		
	Longest Center-Link		4.6 in. (117 mm) below ground - 46.9 in. (1192 mm) above			4.1 in. (105 mm) below ground - 47.4 in. (1204 mm) above		
Guard Angle (Cutterbar on Ground)			7.5° - 17.0°			2.5° - 12.0°		
SICKLE								
Drive Type	SK		Not Applicable	Hydraulic Motor / 'C' Belt/Heavy Duty (MD) Wobble Box				
	DK (Except D50)		Hydraulic Motor / Two 'B' Timing Belts / Two Heavy Duty (MD) Wobble Boxes					Two Hydraulic Motors To "C" Belts, Untimed To Heavy Duty (MD) Wobble Boxes
Sickle Speed (Strokes Per Minute)	SK		Not Applicable	1200 - 1500		1200 - 1400	1100 - 1300	1050 - 1200
	DK (Except D50)		1500 - 1900	1400 - 1700		1200 - 1600	1200 - 1500	1100 - 1400
Stroke			3 in. (76 mm)					
Sections - Over-Serrated and Bolted (serrations/inch)	Cut-Out or Solid		14			9 / 14		9
Guards and Hold-Downs	Pointed	D50	Not Applicable		Pointed / Case Hardened / Sheet Metal / Adjuster Bolt			Not Applicable
		D60	Case Hardened or Double Heat Treated / Sheet Metal / Adjuster Bolt					
	Stub (Except D50)		Sheet Metal HD		Sheet Metal or Forged HD	Not Applicable		

SECTION 6. SPECIFICATIONS

HEADER MODEL		D60		D50/D60			D60
HEADER SIZE		15 FT.	20 FT.	25 FT.	30 FT.	35 FT.	40 FT.
CONVEYOR AND DECKS							
Draper Drive		Hydraulic					
Draper Width		41.6 in. (1057 mm)					
Draper Speed		0 - 742 ft/min (225 m/min)					
Delivery Opening	D50	Not Applicable		67.3 - 75.6 in. (1710 - 1920 mm)			Not Applicable
	D60	60.61 - 69.7 in. (1540 - 1770 mm)	67.1 - 76.7 in. (1720 - 1950 mm)				
	Height	37.2 - 41.7 in. (945 - 1058 mm)					
Draper Angle (Cutterbar on Ground)	D50 & D60	13.0° - 18.4°					
REEL							
Drive		Hydraulic From Windrower Hydraulic Oil Supply					
Speed		0 - 62 rpm					
Quantity of Tine Tubes		6/9		5 - D50, 6 / 9 - D60		5 / 6	5
Effective Reel Diameter		65 in. (1650 mm)					
Finger Tip Radius Range		30.2 - 31.5 in. (766 - 800 mm)					
Finger Type	Plastic	-		Standard			
	Heavy Duty Plastic	Standard		Optional D60			-
Finger Spacing		6.0 in. (152.4 mm)					
UPPER CROSS AUGER (Optional)							
Outside Diameter		12 in. (305 mm)					
Weight (lb (kg))		134 (61)	163 (74)	192 (87)	221 (100)	250 (113)	279 (127)
STABILIZER WHEELS (Optional)							
Size		Not Applicable			ST205 / 75R-15		
Pressure					Load Range E - 80 psi (552 kPa) Load Range D - 60 psi (415 kPa)		
Weight					200 lb (91 kg)		

NOTES: 1. Specifications and design are subject to change without notice, or obligation to revise previously sold units.
2. Weights do not include options.

7 OPERATION

7.1 OWNER/OPERATOR RESPONSIBILITIES

CAUTION

- **It is your responsibility to read and understand this manual completely before operating the header. Contact your MacDon Dealer if an instruction is not clear to you.**
- **Follow all safety messages in the manual and on safety signs on the machine.**
- **Remember that YOU are the key to safety. Good safety practices protect you and the people around you.**
- **Before allowing anyone to operate the header, for however short a time or distance, make sure they have been instructed in its safe and proper use.**
- **Review the manual and all safety related items with all Operators annually.**
- **Be alert for other Operators not using recommended procedures or not following safety precautions. Correct these mistakes immediately, before an accident occurs.**
- **Do not modify the machine. Unauthorized modifications may impair the function and/or safety and affect machine life.**
- **The safety information given in this manual does not replace safety codes, insurance needs, or laws governing your area. Be sure your machine meets the standards set by these regulations.**

7.2 OPERATIONAL SAFETY

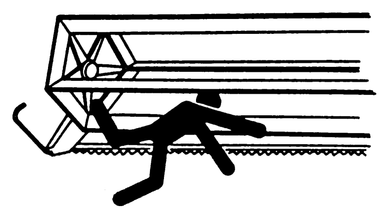
Follow these safety precautions:

CAUTION

- **Follow all safety and operational instructions given in your Operator's Manuals. If you do not have a windrower manual, get one from your dealer and read it thoroughly.**
- **Never attempt to start the engine or operate the machine except from the windrower seat.**
- **Check the operation of all controls in a safe clear area before starting work.**



- **Do not allow riders on windrower.**
- **Never start or move the machine until you are sure all bystanders have cleared the area.**



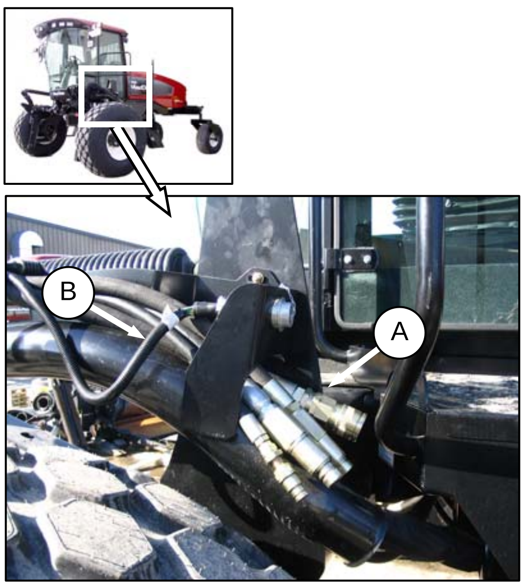
- **Avoid travelling over loose fill, rocks, ditches or holes.**
- **Drive slowly through gates and doorways.**
- **When working on inclines, travel uphill or downhill when possible. Be sure to keep transmission in gear when travelling downhill.**
- **Never attempt to get on or off a moving machine.**
- **Do not leave Operator's station while the engine is running.**
- **Stop engine, and remove key before adjusting or removing plugged material from the machine. A child or even a pet could engage the drive.**
- **Check for excessive vibration and unusual noises. If there is any indication of trouble, shut down and inspect the machine. Follow proper shutdown procedure. Refer to Section 7.7 SHUTDOWN PROCEDURE.**
- **Operate only in daylight or good artificial light.**

7.3 HEADER ATTACHMENT/DETACHMENT

7.3.1 ATTACHMENT

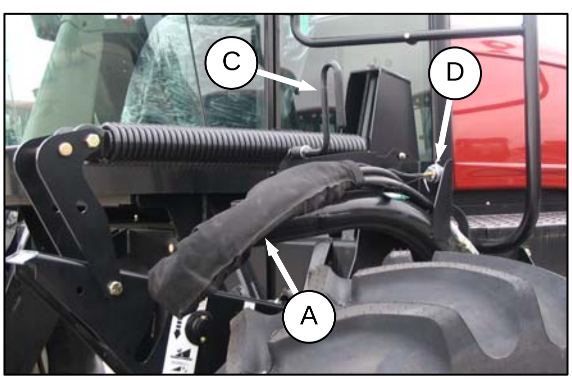
Refer to the M150/M200 or M205 Self-Propelled Windrower Operator's Manual for procedures to mechanically attach the header to the self-propelled windrower. Refer to the following procedures for electrical and hydraulic connections.

The header drive hydraulic hoses and electrical harness are located on the left cab-forward side of the tractor. The reel drive and control hoses are located on the right cab-forward side.

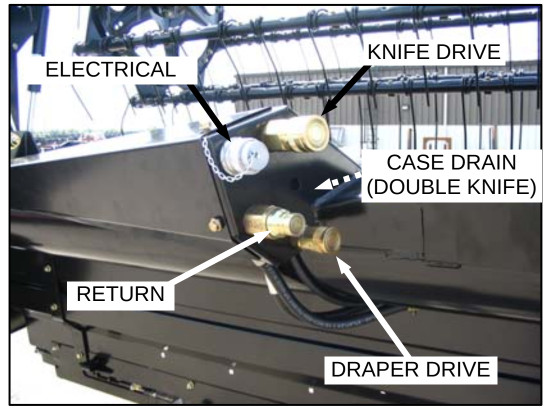


a. Connect header drive hydraulics (A) and electrical harness (B) to header as follows:

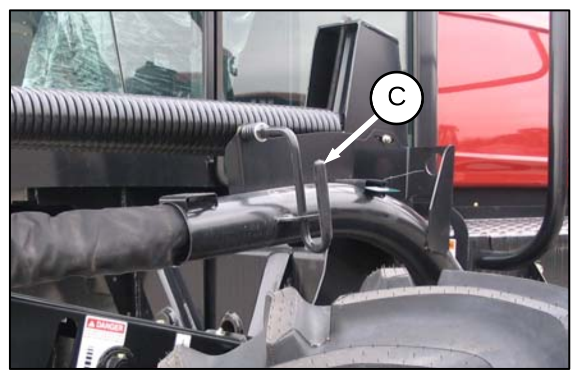
1. Check connectors, and clean if required.



2. Disengage and rotate lever (C) counter clockwise to fully "up" position.
3. Remove cap (D) securing electrical connector to frame.
4. Move hose bundle (A) from tractor around hose support on header.

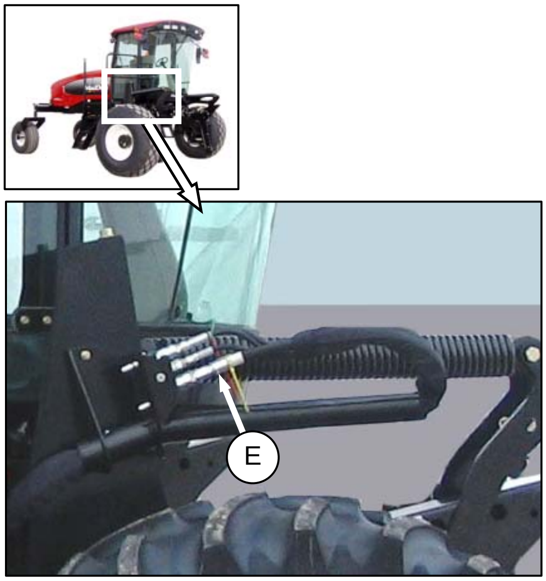


5. Push hose connectors onto mating receptacle until collar on receptacle snaps into "lock" position.
6. Remove cover on electrical receptacle.
7. Push electrical connector onto receptacle, and turn collar on connector to lock it in place.
8. Attach cover to mating cover on tractor wiring harness.

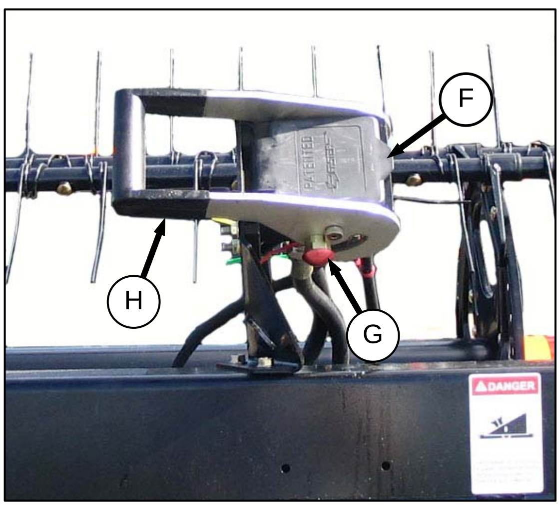


9. Lower lever (C), and engage in "down" position.

(continued next page)



b. Connect reel hydraulics (E) as follows:
   1. Check connectors, and clean if required.



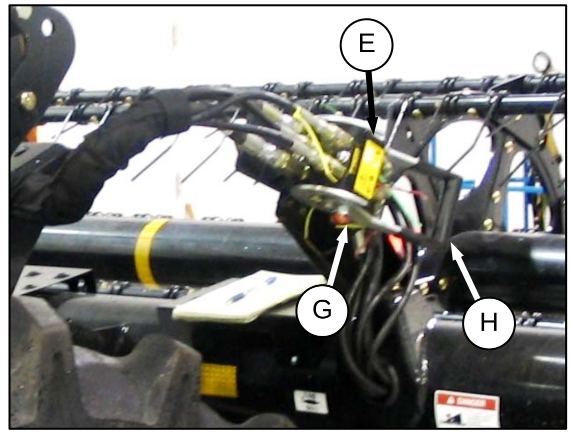
   2. Open cover (F) on header receptacle.
   3. Push in lock button (G), and pull handle (H) to “half open” position.
   4. Remove hose bundle with multi-coupler (E) from tractor, position onto header receptacle, and push handle (H) to engage pins on connector.
   5. Push handle away from hoses until lock button (G) snaps out.

c. Raise and lower header and reel a few times to allow trapped air to pass back to the reservoir.

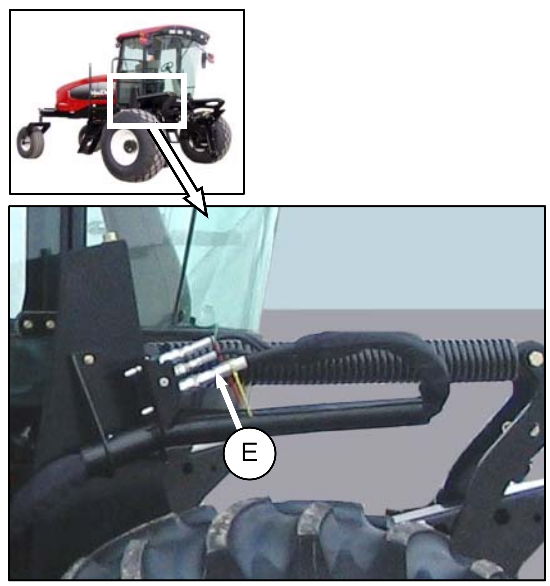
7.3.2 DETACHMENT

a. Fully lower the reel.

b. Disconnect the reel hydraulics as follows:



   1. Push in lock button (G), and pull handle (H) to disengage multi-coupler (E) from header receptacle.



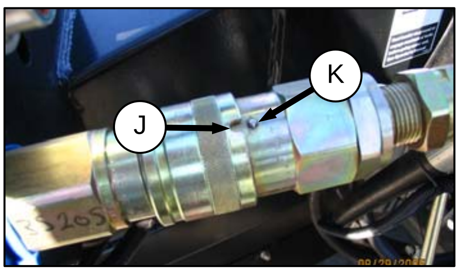
   2. Route hose bundle back onto windrower, and store multi-coupler (E) on hose support.
   3. Close cover (F) on header receptacle. (shown in previous column)

(continued next page)

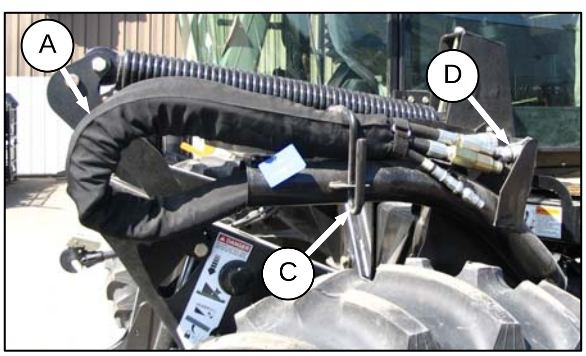
c. Disconnect the header drive hydraulics as follows:



1. Disengage and rotate lever (C) counter clockwise to fully up position.
2. Disconnect electrical connector from header.
3. Disconnect hoses from header as follows:



i. Line up slot (J) in collar with pin (K) on connector.
ii. Push collar toward pin, and pull connector to disengage.
iii. Install caps on connectors and hose ends (if equipped).



4. Route hose bundle (A) back onto hose support on windrower.
5. Rotate lever (C), and lock in down position.
6. Install cap (D) on electrical connector.

d. Detach header from windrower. Refer to the M150/M200 or M205 Self-Propelled Windrower Operator's Manual.

7.4 BREAK-IN PERIOD

a. After attaching header to windrower for the first time, operate the machine with reel drapers and sickle running slowly for 5 minutes, watching and listening FROM THE OPERATOR'S SEAT for binding or interfering parts.

NOTE

Reel and side drapers will not operate until oil flow fills the lines.

CAUTION

Before investigating an unusual sound or attempting to correct a problem, shut off engine, and remove key.

b. Perform the items specified in 8.11.1 Break-In Inspections.

NOTE

Until you become familiar with the sound and feel of your new header, be extra alert and attentive.

7.5 PRE-SEASON CHECK

Perform the following the beginning of each operating season:

CAUTION

- **Review the Operator's Manual to refresh your memory on safety and operating recommendations.**
- **Review all safety signs and other decals on the header and note hazard areas.**
- **Be sure all shields and guards are properly installed and secured. Never alter or remove safety equipment.**
- **Be sure you understand and have practiced safe use of all controls. Know the capacity and operating characteristics of the machine.**
- **Check the first aid kit and fire extinguisher. Know where they are and how to use them.**

a. Adjust tension on drive belts. Refer to Sections 8.7.8 Sickle Drive Belts - Non-Timed Drive and 8.7.9 Sickle Drive Belts - Timed Drive.

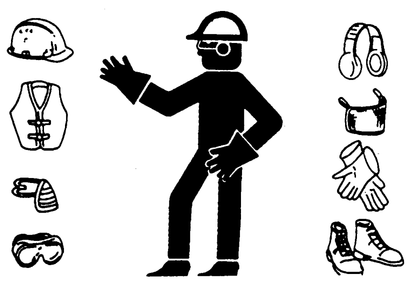
b. Perform all annual maintenance. See Section 8.11 MAINTENANCE SCHEDULE.

7.6 DAILY START-UP CHECK

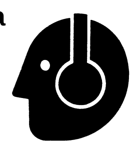
Do the following each day before start-up:

CAUTION

- **Clear the area of other persons, pets etc. Keep children away from machinery. Walk around the machine to be sure no one is under, on or close to it.**
- **Wear close fitting clothing and protective shoes with slip resistant soles.**
- **Remove foreign objects from the machine and surrounding area.**
- **As well, carry with you any protective clothing and personal safety devices that COULD be necessary through the day. Don't take chances.**
- **You may need:**



  - **a hard hat**
  - **protective glasses or goggles**
  - **heavy gloves**
  - **respirator or filter mask**
  - **wet weather gear**
- **Protect against noise. Wear a suitable hearing protective device such as ear muffs or ear plugs to protect against objectionable or uncomfortable loud noises.**



a. Check the machine for leaks or any parts that are missing, broken, or not working correctly.

NOTE

Use proper procedure when searching for pressurized fluid leaks. Refer to Section 8.5.4 Hoses and Lines.

b. Clean all lights and reflective surfaces on the machine.

c. Perform all Daily maintenance. Refer to Section 8.11 MAINTENANCE SCHEDULE.

7.7 SHUTDOWN PROCEDURE

CAUTION

Before leaving the windrower seat for any reason:

- **Park on level ground if possible.**
- **Lower the header fully.**
- **Place all controls in NEUTRAL or PARK.**
- **Disengage header drive.**
- **Stop engine, and remove key from ignition.**
- **Wait for all movement to stop.**

7.8 HEADER CONTROLS

CAUTION

Be sure all bystanders are clear of machine before starting engine or engaging any header drives.

See your Windrower Operator's Manual for identification of in-cab controls for:

- Header Drive Clutch
- Header Height
- Header Angle
- Ground Speed
- Reel Speed
- Reel Height
- Reel Fore-Aft Position

7.9 HEADER LIFT CYLINDER LOCK-OUTS

DANGER

To avoid bodily injury or death from fall of raised machine, always engage lift cylinder stops before going under header for any reason. See your Windrower Operator's Manual for instructions for use and storage of header lift cylinder stops.

7.10 REEL PROPS

WARNING

To avoid bodily injury from fall of raised reel, always engage reel props before going under raised reel for any reason.

IMPORTANT:

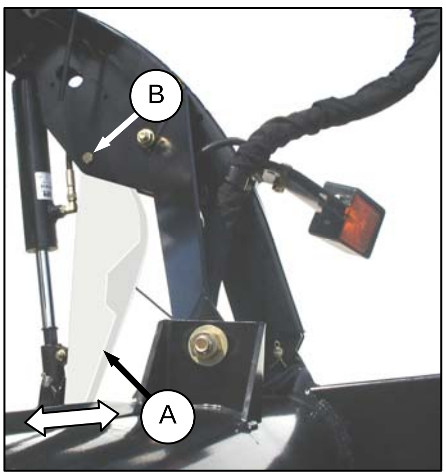
To prevent damage to reel support arms, do not transport header with reel props engaged.

Reel props are located at each reel support arm.

To engage reel props, proceed as follows:

D60 Header:

a. Raise reel to maximum height.

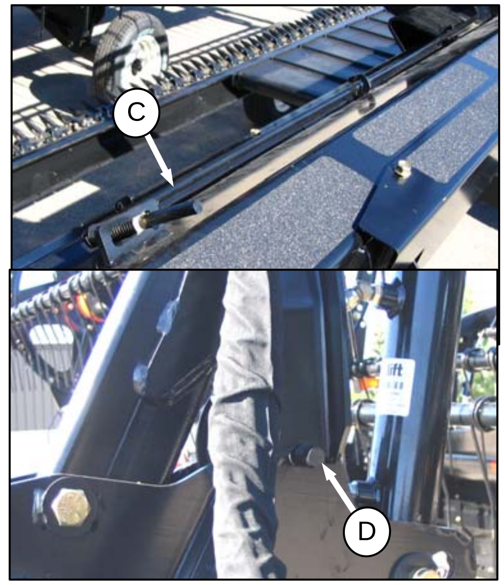


D60

b. Move props (A) to engaged position.

NOTE

Keep pivot bolt (B) properly tightened so prop remains in stored position when not in use, yet can be engaged with hand force.



D60 HARVEST HEADER

c. At the center reel arm on split reel headers, move lock (C) to inboard position to engage pin (D) under prop.

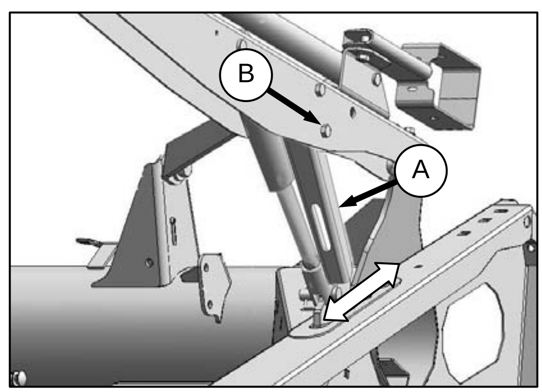
d. Lower reel until props contact end frames.

e. To disengage reel props, raise reel, push outside arm props (A) back against reel arm.

f. For split reel headers, move lock (C) to outboard position.

D50 Header

a. Raise reel to maximum height.



b. Move props (A) to **engaged** position.

c. Lower reel until props contact end frames.

NOTE

Keep pivot bolt (B) properly tightened so prop remains in stored position when not in use, yet can be engaged with hand force.

d. To disengage reel props, raise reel, push outside arm props (A) back against reel arm.

7.11 HEADER SET-UP

The following table is included as a guideline for setting the pick-up reel and the header. Settings other than those suggested can be made to suit various crops and conditions not covered in the table.

To use the table, proceed as follows:

1. Determine crop type to be cut.
2. Determine desired stubble length.
3. Determine condition of the crop.
4. Locate the most suitable set-up for the reel.
5. Refer to chart for reel settings.

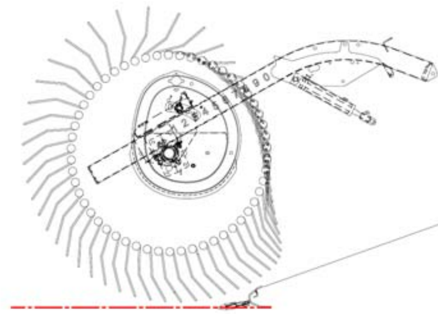
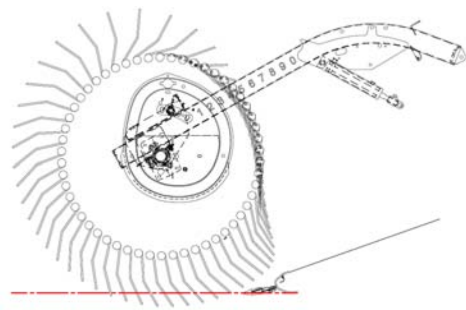
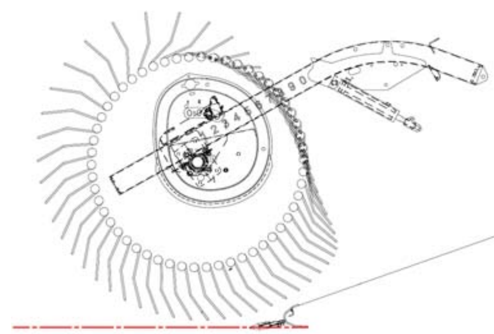
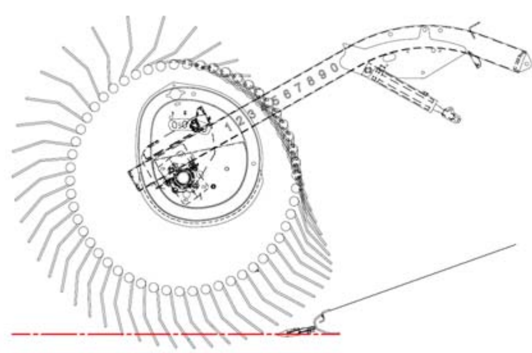
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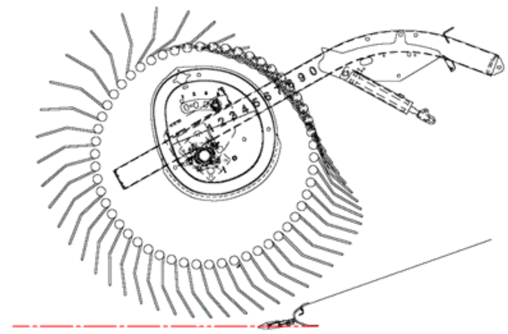
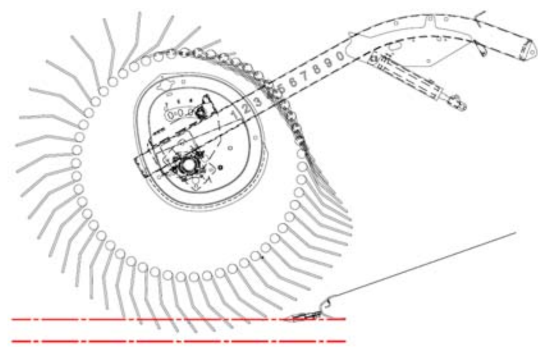
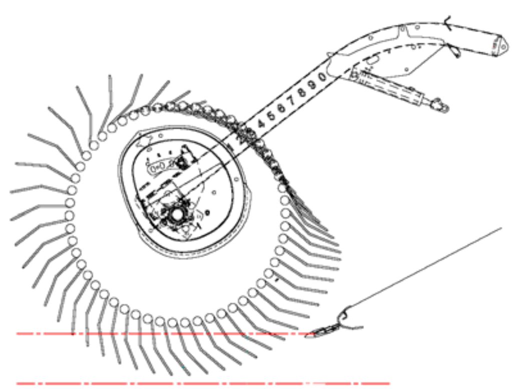
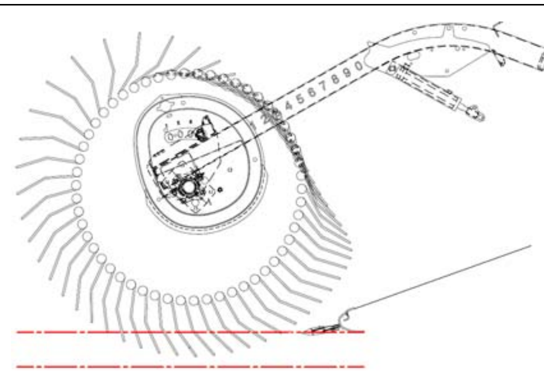
Example shown below: Canola, leave long stubble, heavy crop. Select set-up B. In Reel Settings Chart (next page) - Set cam at 2, position reel at 3 or 4, and cut with varying header angles to suit varying crop conditions.

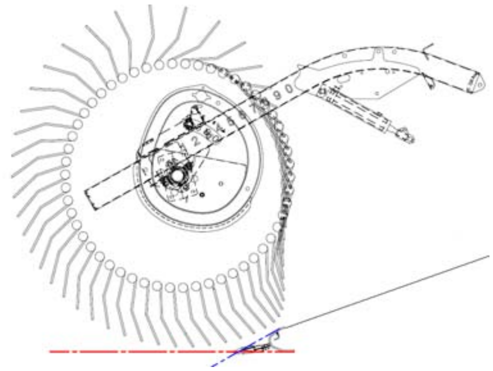
CROP TYPE	STUBBLE	RECOMMENDED MACHINE SET-UP				SEE NOTES BELOW
		CROP CONDITION				
		LIGHT	NORMAL	HEAVY	LODGED	
Cereals	4" - 8"	**E**	**A**	**B**	**D or G**	a, b, c, e, f
	10"+	**F**	**A**	**B**	**D or G**	a, b, c, e, f
	Ground	**C**	**A**	**A**	**A**	a, c
Alfalfa	4" - 8"	**E**	**A**	**A or C**	**-**	a, c
Canola	**10"+**	**F**	**A**	**B or H**	**D**	a, b, c, f
Grass	Ground	**A**	**A or J**	**J**	**-**	a, c, d
Rice	10"+	**F**	**A**	**G**	**G**	a, b, c, e, f

NOTES:

a. Adjust reel forward to get closer to ground, or when tilting header back. Fingers/Tines will dig into ground at extreme reel forward positions, so adjust skid shoes or header angle to compensate. Adjust reel rearward to get reel further away from ground, or when tilting header forward.
b. Header tilt can be increased to get reel closer to ground, or decreased to get reel further away from ground while keeping material flowing onto drapers.
c. Increase cam angle and/or speed to reduce lumps in swath and to spread crop further rearward on drapers for a thinner crop mat.
d. Adjusting cam to more aggressive position will have a tendency to fluff up the swath and keep the heads to the outside of the swath.
e. To leave maximum amount of stubble behind in lodged crop, raise header but increase header tilt to keep reel close to ground. Position reel fully forward.
f. Reel may have to be moved back to prevent lumps in swath or plugging on cutterbar in thinner crops.
g. Minimum crop carrying capacity (minimum area of exposed draper between reel and header backsheet) occurs with the reel in the "furthest aft" position.
h. Maximum crop carrying capacity (maximum area of exposed draper between reel and header backsheet) occurs with the reel in the "furthest forward" position.
i. The tip speed of the fingers/tines at the Cutterbar becomes higher than the reel speed at higher cam settings due the nature of the cam action. Refer to the following Reel Settings Chart.

REEL SETTING REFERENCE	CAM SETTING NUMBER (Finger Speed Gain)	REEL POSITION NUMBER	HEADER ANGLE	REEL FINGER PATTERN
A	**2** **(20%)**	**6 or 7**	**Middle**	
B	**2** **(20%)**	**3 or 4**	**Variable**	
C	**3** **(30%)**	**6 or 7**	**Middle**	
D	**3** **(30%)**	**3 or 4**	**Variable**	

REEL SETTING REFERENCE	CAM SETTING NUMBER (Finger Speed Gain)	REEL POSITION NUMBER	HEADER ANGLE	REEL FINGER PATTERN
E	4 (35%)	6 or 7	Middle	
F	4 (35%)	2 or 3	Variable	
G	4 (35%)	1	Maximum	
H	4 (35%)	1	Variable	

REEL SETTING REFERENCE	CAM SETTING NUMBER (Finger Speed Gain)	REEL POSITION NUMBER	HEADER ANGLE	REEL FINGER PATTERN
J	**1** **(0)**	**6 or 7**	**Middle**	

7.12 HEADER OPERATING VARIABLES

Satisfactory function of the header in all situations requires making proper adjustments to suit various crops and conditions.

Correct operation reduces crop loss, and allows cutting of more acres. As well, proper adjustments and timely maintenance will increase the length of service you receive from the machine.

The variables listed below and detailed on the following pages will affect the performance of the machine. You will quickly become adept at adjusting the machine to give you the desired results.

VARIABLE	SECTION
Cutting Height	7.12.1
Header Float	7.12.2
Header Angle	7.12.3
Reel Speed	7.12.4
Ground Speed	7.12.5
Draper Speed	7.12.6
Knife Speed	7.12.7
Reel Height	7.12.8
Reel Fore-Aft Position	7.12.9
Reel Tine Pitch	7.12.10
Crop Dividers and Rods	7.12.11

7.12.1 CUTTING HEIGHT

The D Series of draper headers are designed to allow an Operator to cut the crop above the ground for a desired stubble height, or to cut the crop at ground level with the header on the ground.

Cutting height will vary, depending on type of crop, crop condition, etc. Refer to Section 7.11 HEADER SET-UP.

7.12.1.1 Cutting Off The Ground

Cutting height is controlled with a combination of header lift cylinder adjustment and a stabilizer wheel system or a stabilizer/slow speed transport wheel system.

The stabilizing wheel system in both options is designed to minimize bouncing at the header ends and may be used to "float" the headers to achieve an even cutting height when cutting above ground level in cereal grains. The system can provide very even stubble height and greatly reduced Operator fatigue. Both systems are only available on 30, 35, and 40 FT. headers.

The proper setting requires 'balancing' the amount of header weight carried by the Float and the stabilizer wheels.

CAUTION

Stop engine, and remove key from ignition before leaving Operator's seat for any reason. A child or even a pet could engage an idling machine.

a. Raise the header so that the stabilizer wheels are off the ground. Shutdown engine and remove the key.

b. Check that the Float is working properly. See Section 7.12.2 Header Float.

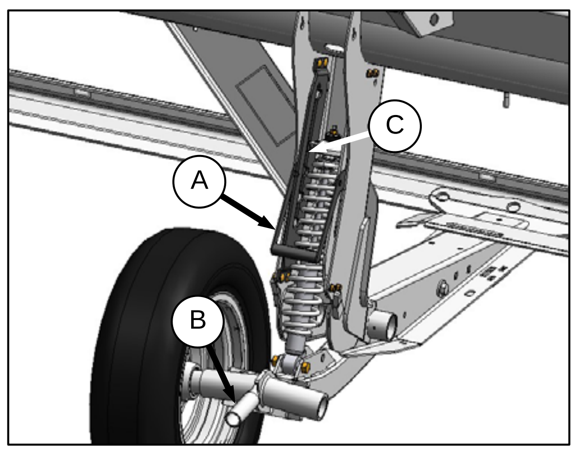
c. Set up the stabilizer wheels, if installed, as follows: Otherwise, proceed to step d.

IMPORTANT

Do not use the stabilizer wheel system for header height control if your header was manufactured prior to 2007. This would result in damage to the wheel suspension system.

CAUTION

Handle may be under tension, especially when the wheels are on the ground. Raise header so that wheels are off the ground before making adjustments.



LH SHOWN - RH OPPOSITE

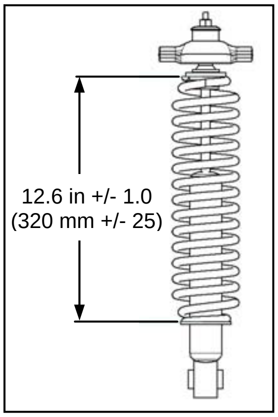
1. Support wheel weight by lifting slightly with one hand. Pull "up" on handle (A) to release lock.
2. Lift wheel with handle (B) to and engage support channel into center slot (C) in upper support.
3. Push "down" on handle (A) to lock.

(continued next page)

4. Lower header to desired cutting height using windrower controls, and check spring length as shown. Re-adjust wheels as required to achieve range.

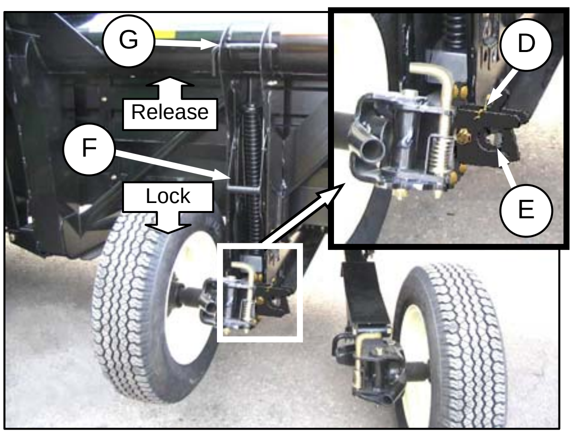
IMPORTANT

Continuous operation with excessive spring compression (i.e. spring length shorter than 11.6 in. (295 mm) can result in damage to the suspension system.



d. Set up the stabilizer/slow speed transport wheels, if installed, as follows: Otherwise, go to step e.

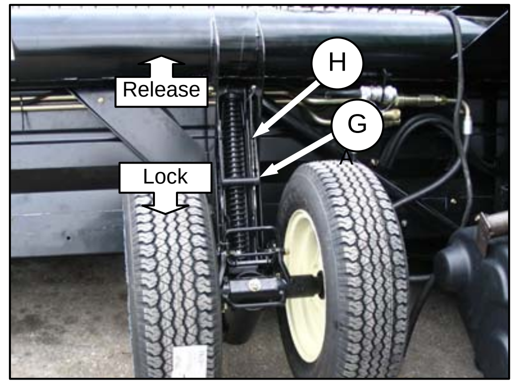
1. Adjust right wheels as follows:



TRANSPORT TO FIELD - RH SIDE

i. Remove hairpin (D) from latch (E).
ii. Disengage latch (E), and lift right wheel out of hook, and place on ground as shown. This reduces weight of assembly, and makes adjusting wheel position easier.
iii. Support left wheel weight by lifting slightly with one hand. Pull up on handle (F) to release lock.
iv. Lift left wheel to desired height, and engage support channel into slot (G) in upper support.
v. Push down on handle (F) to lock.
vi. Lift right hand wheel back into field position, and ensure latch (E) is engaged.
vii. Secure latch with hairpin (D).

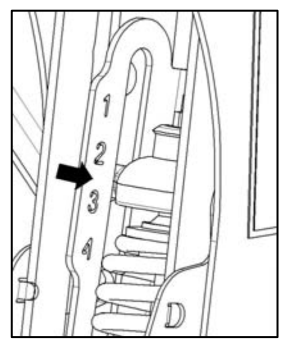
2. Adjust left wheels as follows:



i. Support wheel weight by lifting slightly with one hand. Pull up on handle (G) to release lock.
ii. Lift wheels to desired height, and engage support channel into slot (H) in upper support.
iii. Push down on handle (G) to lock.
iv. Lower header to desired cutting height using windrower controls, and check load indicator as shown below. Re-adjust wheels as required to achieve range between 2 and 3 shown.

IMPORTANT

Continuous operation with excessive spring compression (i.e. load indicator reading greater than #4) can result in damage to the suspension system.



e. Adjust header angle to desired working angle with the machine's header angle controls. If angle is not critical, set it to "mid-position".

f. Use the windrower CDM (Cab Display Module) controls to automatically maintain cutting height. Refer to your Windrower Operator's Manual for details.

7.12.1.2 Cutting On The Ground

Cutting on the ground is controlled with a combination of skid shoes, header angle, and float adjustment, and **not** with the header lift cylinders. Having the header "ride" on the skid shoes allows the float linkage to float header over obstacles and follow ground contours, rather than supporting the header with the cylinder.

Lowering the skid shoes or decreasing header angle increases the cutting height. This may be desirable in stony conditions to reduce damage to cutting components. Also, a longer stubble length helps material dry faster.

Raising the skid shoes and increasing header angle allows the crop to be “shaved”.

Set up the header as follows:

a. Fully raise the stabilizer wheels, or slow speed transport wheels if installed. Refer to previous section.

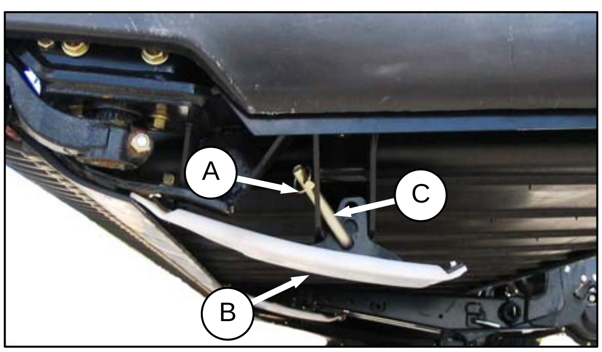
DANGER

To avoid bodily injury or death from unexpected start-up or fall of raised machine, stop engine, remove key and engage lift cylinder stops before going under machine to adjust skid shoes or for any reason.

b. Fully raise header, engage lift cylinder stops, shutoff engine and remove key.

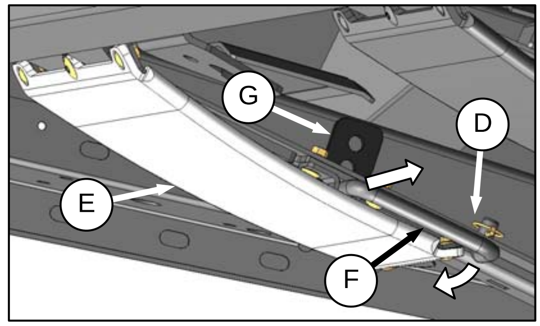
c. Adjust skid shoes to achieve desired cutting height as follows:

<u>Outer Skid Shoes</u>

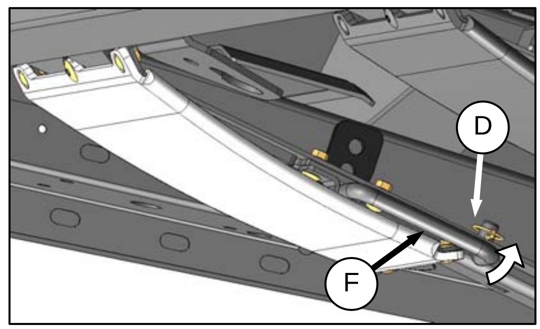


1. Remove lynch pin (A) at each skid shoe (B).
2. Hold shoe, and remove pin (C) by disengaging frame, and then pulling away from shoe.
3. Raise or lower skid shoe to desired position using holes in support as a guide.
4. Re-install pin (C), engage in frame, and secure with lynch pin (A).

<u>Inner Skid Shoes</u>



1. Remove lynch pin (D).
2. Hold shoe (E), and remove pin (F) by pulling down to disengage frame, and then pulling away from shoe.
3. Raise or lower skid shoe (E) to desired position using holes in support (G) as a guide.



4. Re-insert pin (F), engage in frame, and secure with lynch pin (D).

d. Check that skid shoes are adjusted to the same position.

e. Adjust header angle to desired working position using the machines’ header angle controls. If angle is not critical, set it to “mid-position”.

f. Check header float as described in the following section.

7.12.2 HEADER FLOAT

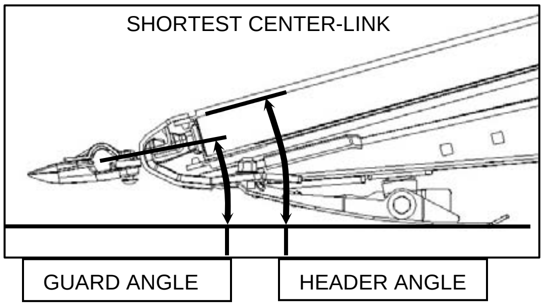
Refer to the M100, M150/M200 or M205 Self-Propelled Windrower Operator’s Manual to check and adjust float on windrower headers.

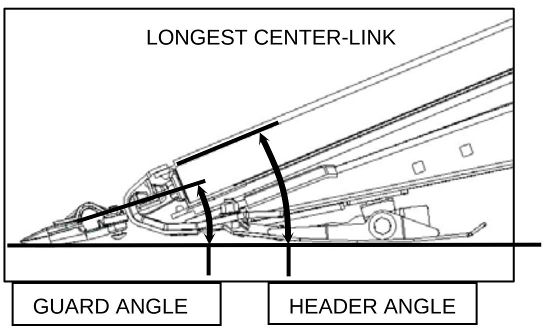
7.12.3 HEADER ANGLE

Header angle is the angle between the drapers and the ground, and is adjustable to accommodate crop conditions and/or soil type.

Guard angle is the similar to header angle which is the angle between the guard upper surface and the ground.

Refer to illustration.





Flatter header angles are recommended for normal crop conditions and for stony ground because it minimizes sickle section breakage, and reduces soil scooping or build-up at the cutterbar in wet conditions.

Steeper angles are recommended in “downed” crops for better lifting action, or for cutting close to the ground in hay for example. Refer to Section 7.12.10 Reel Tine Pitch and Section 7.12.9 Reel Fore-Aft Position for adjustment details.

Header angle also affects the type of windrow that is laid. Refer to Section 7.15 WINDROW TYPES. Choose an angle that maximizes performance for your crop and field conditions.

The following table summarizes the adjustment range:

HEADER WIDTH	DRAPER ANGLE	GUARD ANGLE
15 FT.	N/A	N/A
20 FT.	13.0° - 18.4°	7.0° - 12.4°
25 FT.	13.0° - 18.4°	7.0° - 12.4°
30 FT.	13.0° - 18.4°	2.0° - 7.4°
35 FT.	13.0° - 18.4°	2.0° - 7.4°
40 FT.	13.0° - 18.4°	2.0° - 7.4°

7.12.3.1 Angle Adjustment

The header angle is varied by adjusting the length of the top center-link (mechanical or hydraulic) between the windrower and the header.

Refer to “Header Angle in your Windrower Operator’s Manual for adjustment details.

7.12.4 REEL SPEED

Reel speed affects feeding of crop into the sickle and onto the drapers, as well as the smoothness and evenness of the delivered crop.

Operating the reel too fast or too slow relative to ground speed will cause bunching.

At the proper speed, the reel discs should appear to be being driven by the ground.

- If they look like they are skidding relative to ground, the reel is turning too slow.
- If they look like they are spinning excessively relative to the ground, reel speed may be too fast.

In standing crop, reel speed should be just faster than or equal to ground speed, sweeping crop across the sickle.

Flattened crop or a crop that is leaning away from the cutterbar requires a higher reel speed in relation to ground speed. This can be achieved by increasing reel speed, decreasing ground speed, or both.

Excessive shattering of grain heads or crop loss over the header back tube may be indications that reel speed is too fast.

Excessive reel speed causes undue wear of reel components and unnecessary load on reel drive, resulting in uneven reel motion.

Generally, 9 bat reels can effectively operate at lower reel speed, while minimizing crop loss in shatter prone crops.

The reel speed is adjustable with the controls in the windrower cab. Refer to “Reel Speed” in your Windrower Operator’s Manual for adjustment details.

7.12.4.1 Optional Reel Drive Sprockets - D60

Sprockets are available as an option to the factory installed sprocket. See your MacDon Dealer Parts Department to order sprockets.

Refer to Section 8.9.6 Reel Drive Sprocket - D60 for installation details.

7.12.5 GROUND SPEED

Ground speed should be such that the sickle can cut crop smoothly and cleanly, while giving the desired delivery of material to the opening. Excessive ground speed results in "ragged" cutting. Refer to Section 7.15 WINDROW TYPES for effects of ground speed on windrow formation.

In "tough-to-cut" crops like flax, reduce ground speed to reduce loads on cutting components and drives.

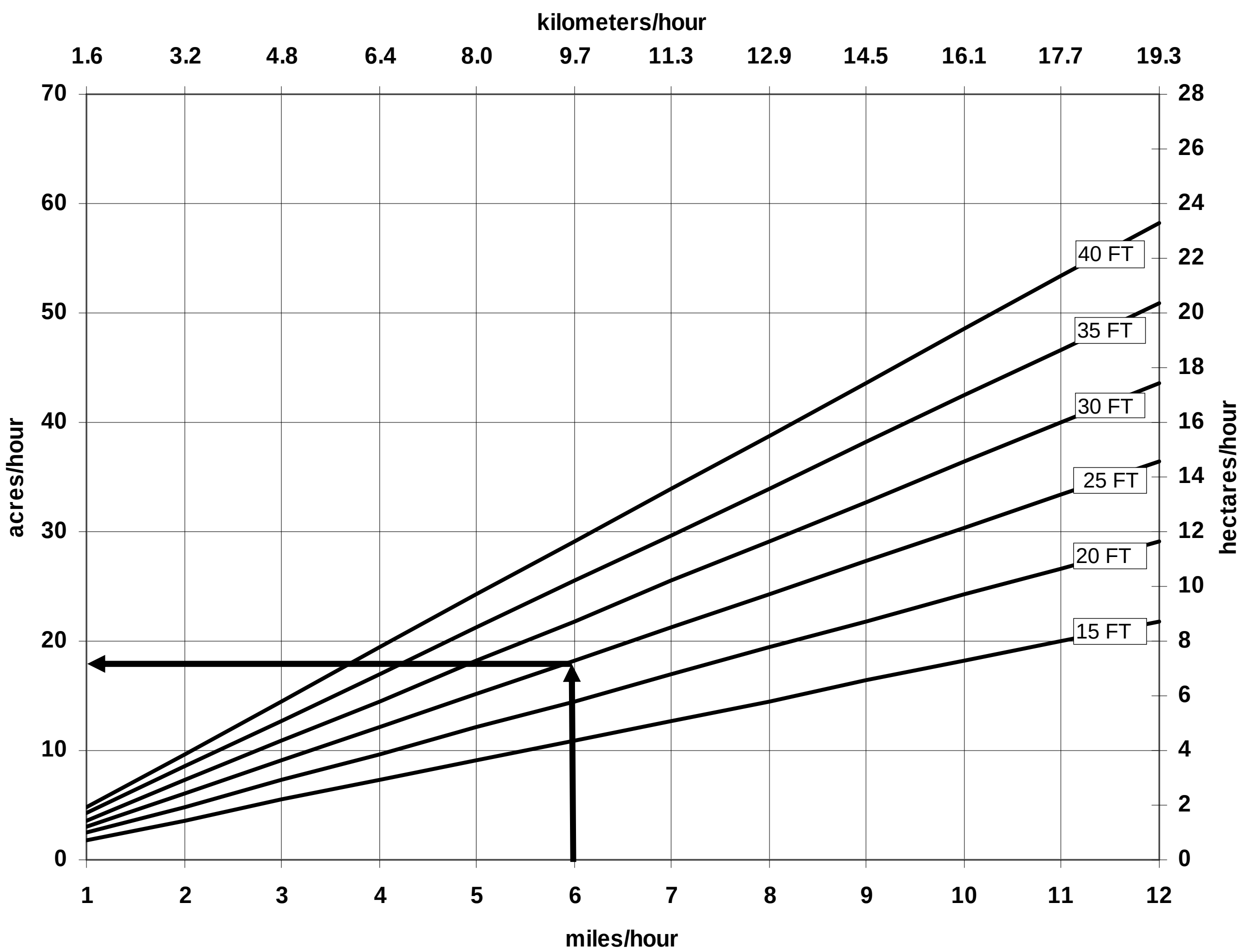
When cutting very light crops like edible beans, ground speed may have to be reduced to allow reel to pull in small and short plants. Start at 3.0 - 3.5 mph (4.8 - 5.8 km/h), and adjust as required.

Higher ground speeds require heavier float settings to prevent excessive bouncing. This will result in increased cutting component damage.

In most cases, as ground speed is increased, draper and reel speed should be increased to handle the extra material.

The chart below indicates the relationship between ground speed and area cut for the seven header sizes.

Example shown below: At a ground speed of 6 miles per hour (9.7 km/h) with a 25 FT. header, the area cut in one hour would be approximately 18 acres (7.3 hectares).



7.12.6 DRAPER SPEED

a. The draper speed is controlled with the windrower CDM (Cab Display Module). Refer to your Self-Propelled Windrower Operator's Manual.

b. Adjust draper speed to achieve good feeding of crop onto adapter draper. Excessive draper speed will reduce draper life.

NOTE

If sufficient draper speed cannot be achieved, a possible cause is low relief pressure. Refer to the Technical Service Manual for checking and adjusting relief pressure.

7.12.7 KNIFE SPEED

The header sickle drive is driven by the windrower hydraulic pump and is controlled with the windrower CDM.

The default speed is 600 revolutions per minute (rpm). Refer to your Self-Propelled Windrower Operator's Manual.

7.12.7.1 Knife Speed Guidelines

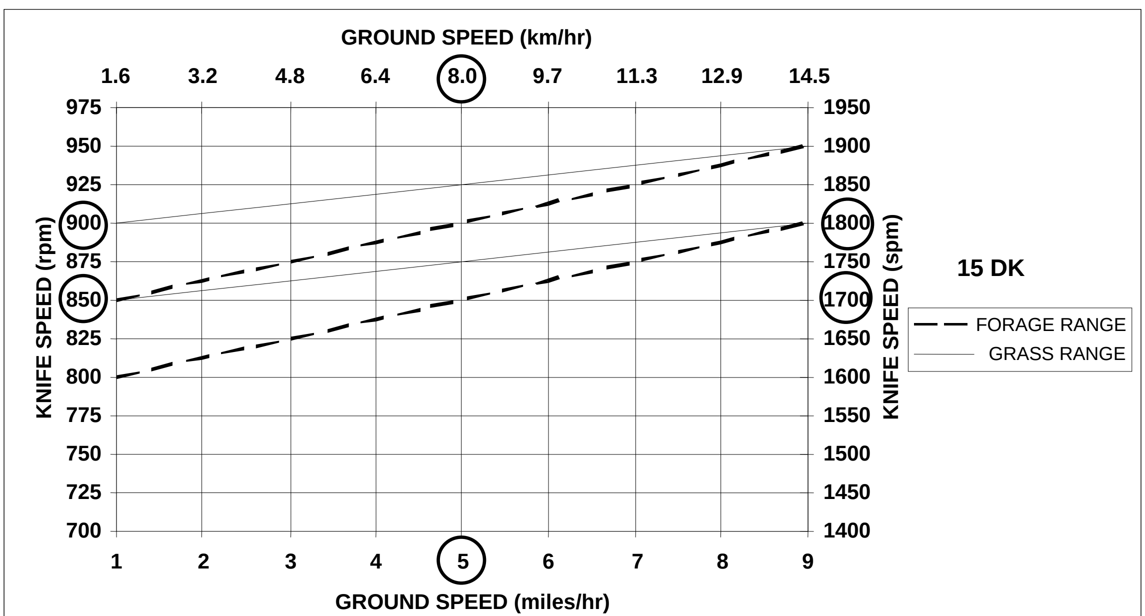
Header Size	Recommended Knife Speed Range (RPM)	
	SK (Single Knife Header on SP Windrower)	DK (Double Knife Header on SP Windrower)
15 FT.	---	750 - 950
20 and 25 FT.	600 - 750	700 - 850
30 FT.	600 - 700	600 - 800
35 FT.	550 - 650	600 - 750
40 FT.	525 - 600	550 - 700

Refer to the following charts for guidelines on the recommended knife speeds to suit a particular crop.

A chart is provided for each header size or range of sizes and whether the header is a single (SK) or double knife (DK) machine.

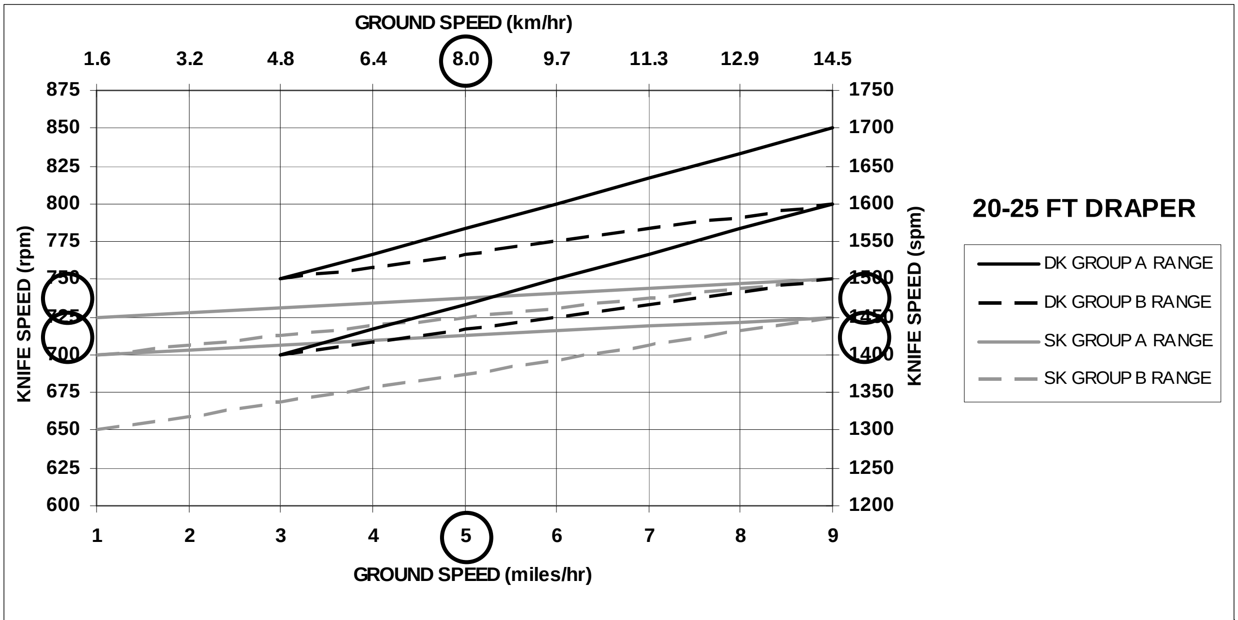
Refer to examples below each chart.

15 Foot Double Knife



Example: Cutting Forage at 5.0 mph (8.0 km/hr)
Use Knife Speed Between 850 - 900 rpm (1700 - 1800 spm).

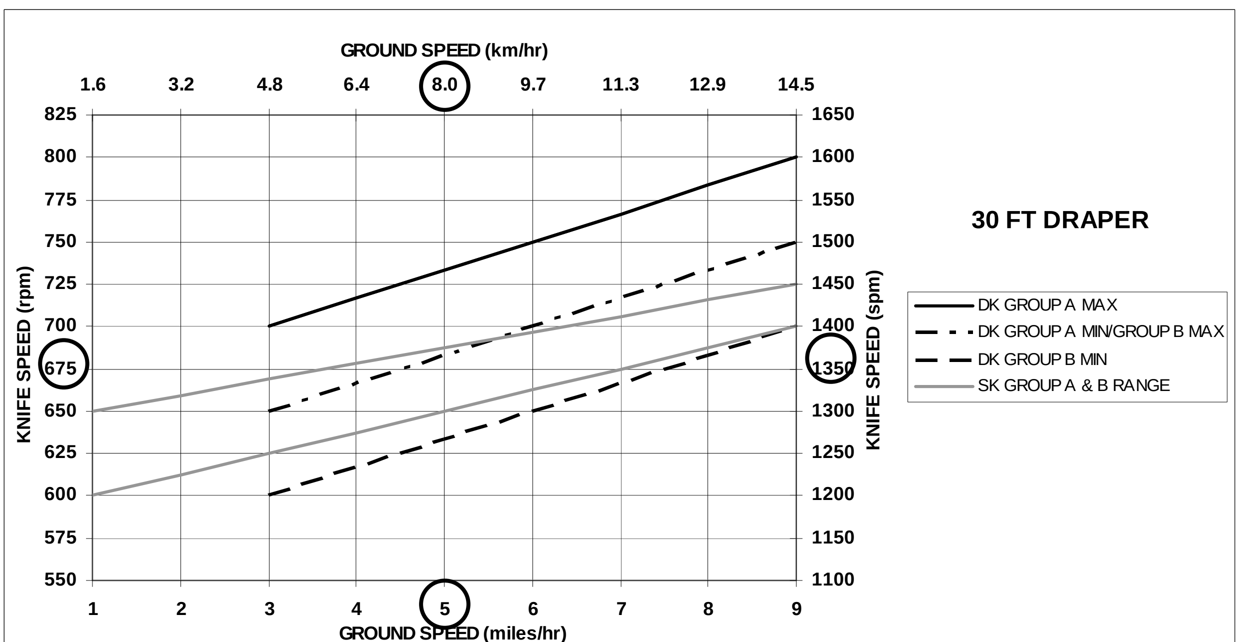
20 and 25 Foot Single and Double Knife



Group A: Forage/Alfalfa/Flax
Group B: Canola/Cereals/Edible Beans

Example: Cutting Group A Crops at 5.0 mph (8.0 km/hr) With Single Knife Use Knife Speed Between 710 - 735 rpm (1420 - 1470 spm).

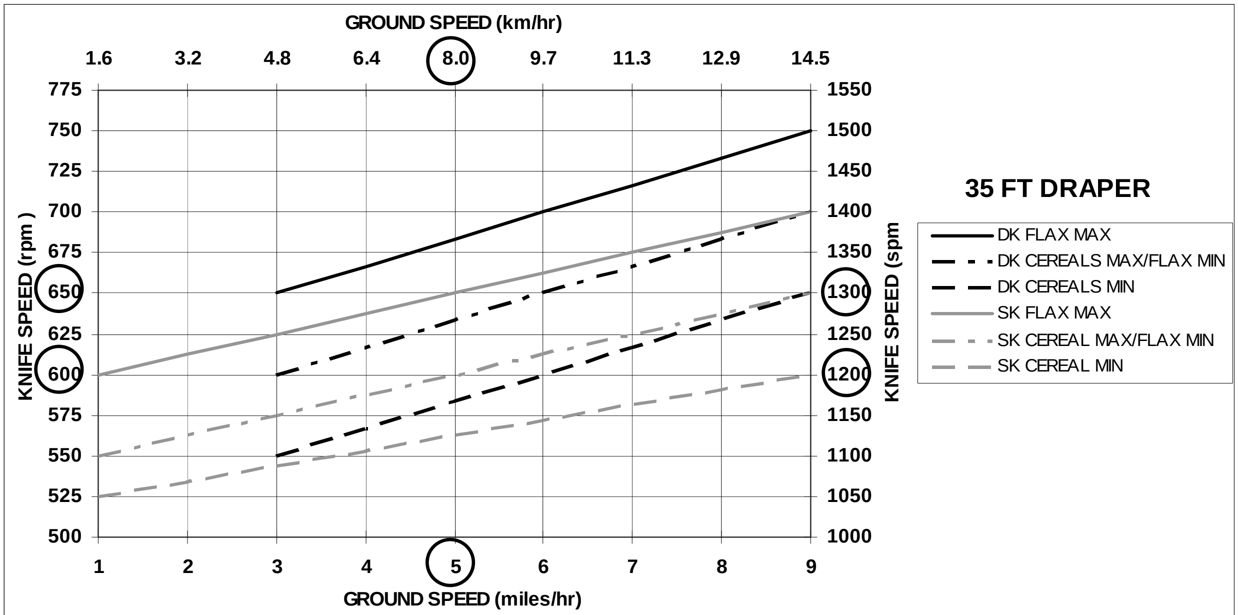
30 Foot Single and Double Knife



Example: Cutting Group A or B Crops at 5.0 mph (8.0 km/hr) With Double Knife Use Knife Speed Approximately 680 rpm (1360 spm).

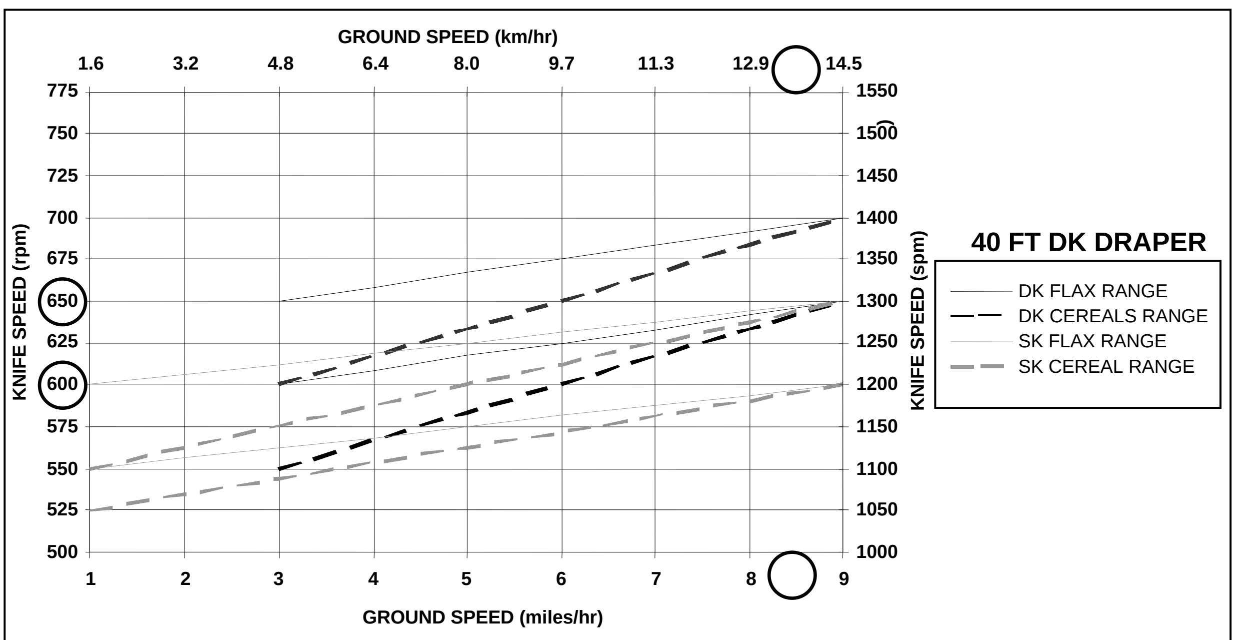
Group A: Forage/Alfalfa/Flax
Group B: Canola/Cereals/Edible Beans

35 Foot Single and Double Knife



Example: Cutting Flax at 5.0 mph (8.0 km/hr) With Single Knife. Use Knife Speed Between 600 - 650 rpm (1200 - 1300 spm).

40 Foot Single and Double Knife



Example: Cutting Fl ax at 8.5 mph (13.7 km/hr) With Single Knife Use Knife Speed Between 595 - 645 rpm (1190 - 1290- spm).

NOTE: Close to maximum Single Knife Speed for 40 ft .which may result in ragged cutting. Double Knife machine allows higher knife speed and clean cutting.

7.12.8 REEL HEIGHT

Depending on crop height, adjust reel height to carry material through the sickle onto the drapers. Operate windrower hydraulics as required. Refer also to Section 7.12.9 Reel Fore-Aft Position.

REEL HEIGHT CHART	
CROP CONDITION	**REEL POSITION**
Laying Down / Lodged	Down (Also Increase Reel Speed and/or Cam Setting)
Bushy or Heavy Standing	Up

NOTE

Indications that reel may be too low are:

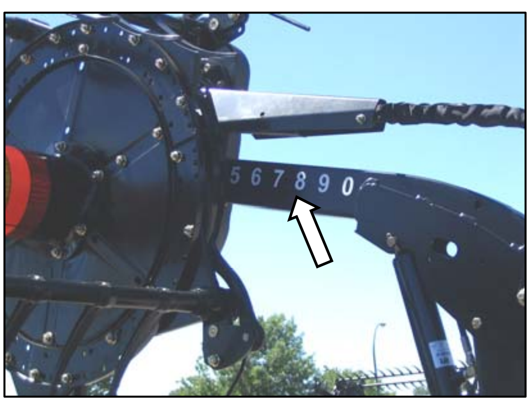
- *crop loss over the header back tube;*
- *disturbance of crop on the drapers by the reel fingers; or*
- *the crop being pushed down by the tine tubes.*

IMPORTANT

Maintain adequate clearance to prevent fingers contacting sickle or the ground. Refer to Section 8.9.1 Reel Clearance to Cutterbar.

7.12.9 REEL FORE-AFT POSITION

Reel position has been found to be a critical factor in achieving good results in adverse conditions. The reel position is factory set for average straight standing crop, and can be adjusted forward and backward for different crop conditions.



A gauge decal is provided on the reel right support arm for identifying a preferred position.

The back edge of the reel cam disc is the gauge indicator.

- For straight standing crop, center the reel over the cutterbar (4 - 5 on gauge).
- For crops that are down, tangled, or leaning, it may be required to move reel ahead of cutterbar (to a lower number on the gauge).

IMPORTANT

When difficulty is encountered picking up down crop, start by adjusting header angle to a steeper position. This tilts the entire reel/sickle/draper combination, and is often all that is required.

Refer to “Header Angle” in your Windrower Operator’s Manual for adjustment details. Adjust reel position only if header angle adjustments are not satisfactory.

NOTE

In difficult to pick up crops such as rice or severely lodged crops that require full forward positioning of the reel, the reel tine pitch can be set to provide proper placement of the crop onto the drapers.

Refer to Section 7.12.10 Reel Tine Pitch for adjustment details.

IMPORTANT

Operating with the reel too far forward can cause the fingers to contact the ground before the cutterbar.

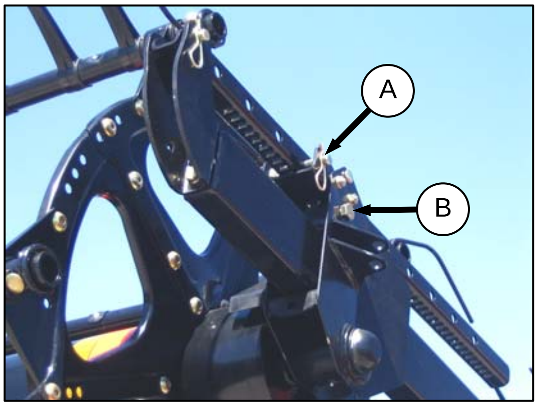
Lower the skid shoes or adjust header tilt as required when operating with the reel in this position. Otherwise, damage to the fingers will occur.

7.12.9.1 Mechanical Adjustment - Fore-Aft

WARNING

Stop windrower engine, and remove key before making adjustments to machine. A child or even a pet could engage the drive.

a. Lower or raise reel so support arms are horizontal, stop engine, and remove key.



b. Remove pin (A) at each support arm.
c. Using a 15/16 in. wrench on bolt (B) turn sprocket inside reel arm to slide reel to the desired position. If reel binds on arms from misalignment, move in smaller increments (two holes at a time).
d. Re-install pin (A). Be sure the same hole is used at each arm.
e. Check that the reel is evenly adjusted.
f. Check reel clearance to cutterbar after making changes to cam setting. Refer to Section 8.9.1 Reel Clearance to Cutterbar and, 8.9.2 Reel Frown Adjustment for measurements and adjustment procedures.

7.12.9.2 Hydraulic Adjustment - Fore-Aft

a. Select the fore-aft adjust mode on the selector switch in the cab (if applicable).
b. Operate the hydraulics to move the reel to the desired position, again using the gauge as a reference.
c. Check reel clearance to cutterbar after making changes to cam setting. Refer to Section 8.9.1 Reel Clearance to Cutterbar and, 8.9.2 Reel Frown Adjustment for measurements and adjustment procedures.

7.12.9.3 Fore-Aft Cylinder Position

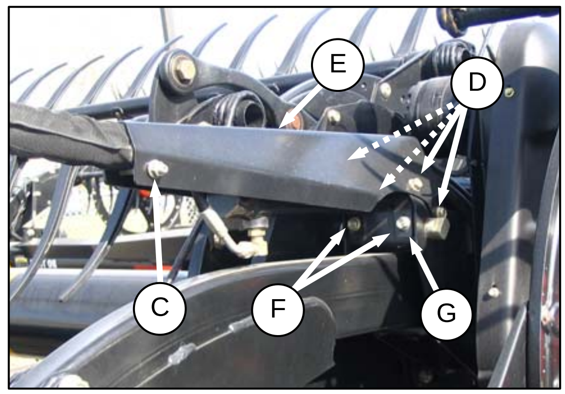
The reel can be moved approximately nine inches further aft by re-positioning the cylinders on the reel arms.

a. Position reel so support arms are horizontal, stop engine, and remove key.

WARNING

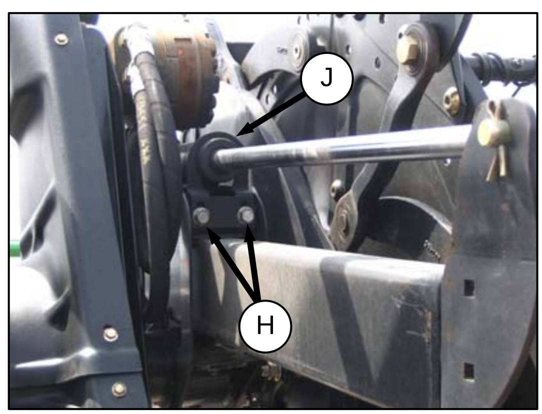
Stop windrower engine, and remove key before making adjustments to machine. A child or even a pet could engage the drive.

b. Re-position center arm cylinder (Double Reel) as follows:



CENTER ARM - AFT

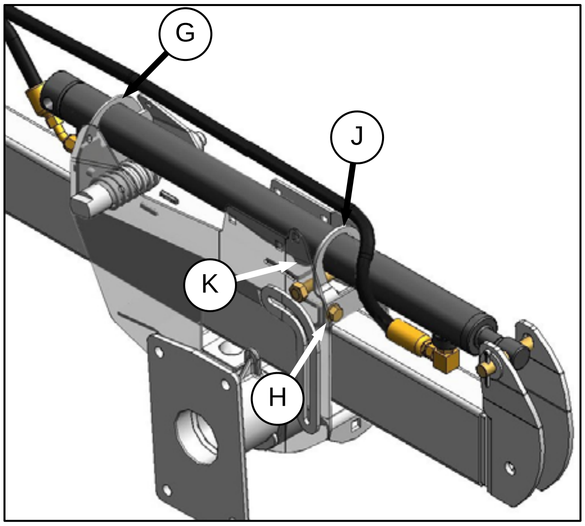
1. Remove bolt and nut (C), and four bolts (D) securing hose shield (E) on center arm (applicable to double reel only).
2. Move hose shield and hoses away from cylinder.
3. Remove bolts (F) that secure aft support plate (G), and remove the plate.



CENTER ARM - FRONT

4. Remove bolts (H), so that front support plate (J) is free to move up.

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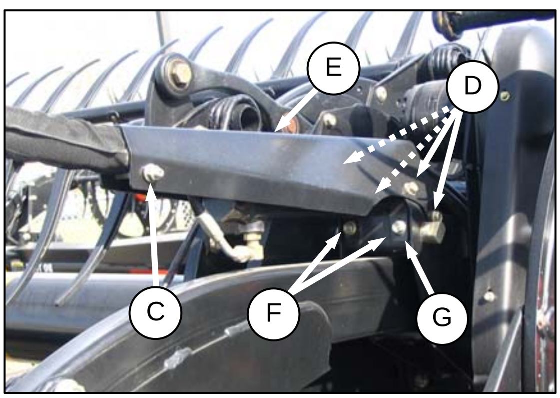


5. Lift the aft end of the cylinder out of support assembly, and retract the cylinder so that cylinder center port fitting (K) engages the support assembly.

NOTE

Loosen a hose fitting to allow movement of cylinder rod. Be sure to re-tighten fitting after cylinder installation.

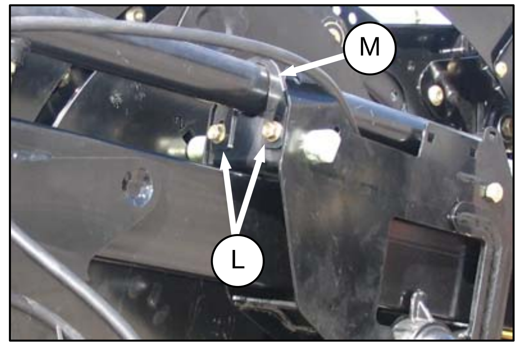
6. Re-install forward support plate (J) with bolts (H).



CENTER ARM - AFT

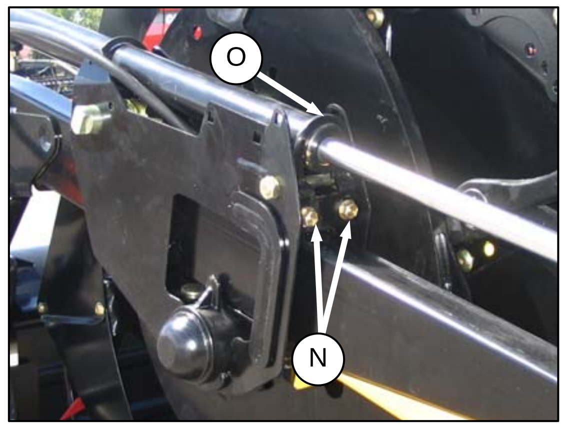
7. Re-position hoses, and re-install shield (E) with bolts (D).
8. Position hoses inside shield ,and install bolt and nut (C).
9. Re-install aft support plate (G) with bolts (F).

c. Re-position right arm cylinder (Double Reel) as follows:



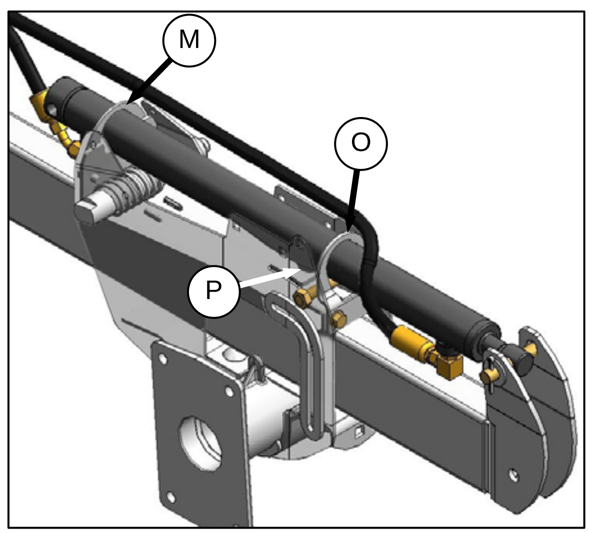
RIGHT ARM - DOUBLE REEL

1. Remove bolts (L) that secure aft plate (M), and remove the plate.



RIGHT ARM - DOUBLE REEL

2. Remove bolts (N) so that front support (O) is free to move up.



3. Lift the aft end of the cylinder out of support assembly, and retract the cylinder so that cylinder center port fitting (P) engages the support assembly.

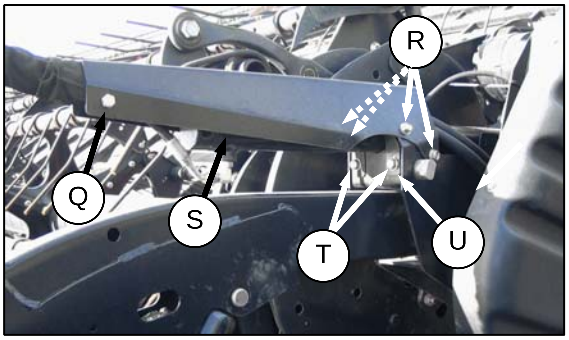
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NOTE

Loosen a hose fitting to allow movement of cylinder rod. Be sure to re-tighten fitting after cylinder installation.

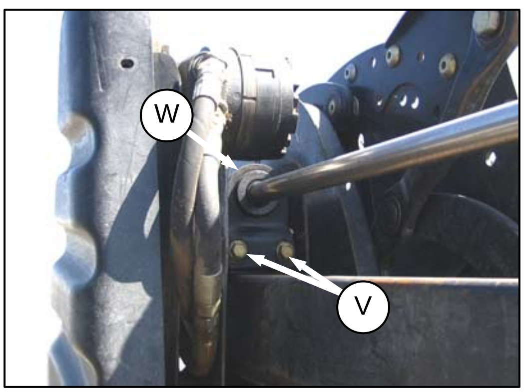
4. Re-install plates (M) and (O) with bolts (L) and (N) respectively.

d. Re-position right arm cylinder (Single Reel) as follows:



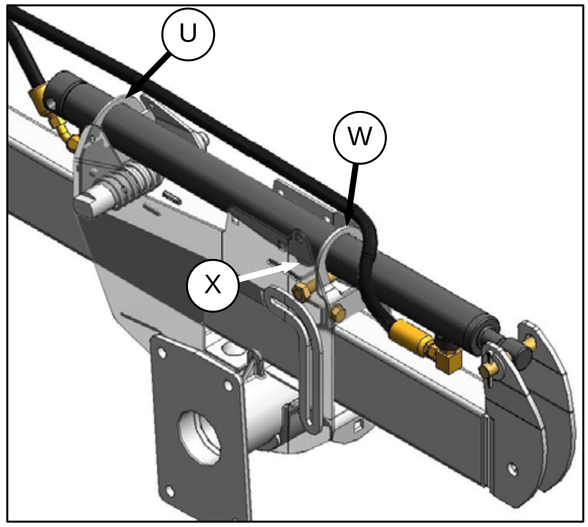
RIGHT ARM - SINGLE REEL

1. Remove bolt, and nut (Q), four bolts (R) securing hose shield (S).
2. Move hose shield and hoses away from cylinder.
3. Remove bolts (T) that secure aft plate (U), and remove the plate.



RIGHT ARM - SINGLE REEL

4. Remove bolts (V) so that front support (W) is free to move up.

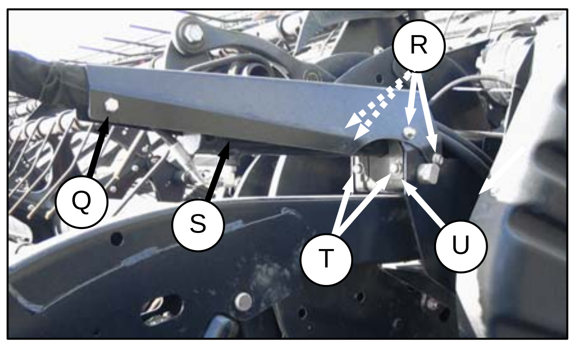


5. Lift the aft end of the cylinder out of support assembly, and retract the cylinder so that cylinder center port fitting (X) engages the support assembly.

NOTE

Loosen a hose fitting to allow movement of cylinder rod. Be sure to re-tighten fitting after cylinder installation.

6. Re-install plates (U) and (W) with previously removed bolts (T) and (V) respectively.

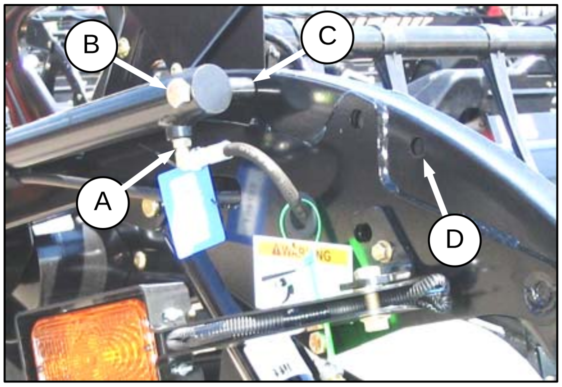


RIGHT ARM - SINGLE REEL

7. Re-position hoses, and re-install shield (S) with bolts (R).
8. Position hoses inside shield, and install bolt and nut (Q).

(continued next page)

e. Re-position left arm cylinder (Double and Single Reel) as follows:



LEFT ARM - SINGLE and DOUBLE REEL

1. Loosen fitting (A) to allow it to rotate when cylinder is re-positioned.
2. Remove the bolt (B), nut, and spacer (C) that secures the cylinder to the reel arm.
3. Extend cylinder so that mounting hole lines up with new location (D) as shown.

NOTE

Loosen a hose fitting to allow movement of cylinder rod. Be sure to re-tighten fitting after cylinder installation.

4. Re-install bolt (B) and nut with spacer (C).
5. Tighten fitting.

f. Check reel clearance to back sheet, upper cross auger (if installed) and reel braces.

g. Adjust reel tine pitch if required. Refer to Section 7.12.10 Reel Tine Pitch, or Section 8.9.1 Reel Clearance to Cutterbar, for adjustment procedure.

7.12.10 REEL TINE PITCH

IMPORTANT

The following describes the concept and operational guidelines of the pick-up reel. Please read carefully before operating the machine.

7.12.10.1 Concept

The pick-up reel is designed to pick up flattened and severely lodged crops. It is not always necessary to increase the tine pitch (higher cam setting) to pick up crops that are lodged, but rather the cam settings are mainly used to determine how the crop will get delivered to the drapers.

The position of the fingers relative to ground (tine pitch) is not significantly affected by the cam setting. For example, the cam position range is 33 degrees, but the corresponding finger pitch range is only 5 degrees at the lowest point of reel rotation.

For best performance, use the minimum cam setting that will deliver the crop past the rear edge of the cutterbar and onto the drapers.

7.12.10.2 Operating Guidelines

The following outlines the function of each cam setting and includes guidelines for set-up in various crop conditions. The setting numbers are visible above the slots on the cam disc. Refer to Section 7.12.10.3 Cam Adjustment.

- **Cam Position 1** - Delivers the most even crop flow onto the drapers without fluffing up or disturbing the material. The crop is released quite close to the cutterbar, and works best with the cutterbar on the ground. Some crops will not be delivered past the cutterbar when the cutterbar is raised off the ground, and the reel is pushed forward. Initially, have the reel speed "about equal" to the ground speed.

- **Cam Position 2** - Recommended starting position for most crops and conditions. This setting gives a finger tip speed approximately 20% faster than the reel speed.

If crops tend to stall on the cutterbar with the reel in a "forward" position, the cam angle should be increased to push the crop past the rear edge of the cutterbar.

If the crop is getting fluffed or the flow across the drapers is disrupted, the cam angle can be decreased.

- **Cam Positions 3 and 4** - Mainly used to leave long stubble. Allows the reel to reach forward and lift the crop across the knife and onto the drapers. The further forward the reel, the higher the cam angle should be.

Cam 4 would be used with the reel being fully forward to leave the maximum amount of stubble in lodged crops. This setting gives a finger tip speed approximately 30% faster than the reel speed.

Cam Position 4, Header Angle At Maximum, and Reel Fully Forward - Provides the maximum amount of reel reach below the cutterbar to pick up lodged crops, and gives a finger tip speed approximately 35% faster than the reel speed.

Cutting height is set to approximately 8 inches (203 mm) to leave a significant amount of stubble. In some crops, it is possible to double ground speed because the amount of material that is being cut is less.

NOTE

High cam settings with the reel fore-aft position at 4 - 5, severely decrease the draper capacity because the reel disrupts crop flow across the drapers. The fingers are still engaged in the crop that is moving on the drapers.

High cam settings are recommended only with the reel at or close to "full forward" settings.

IMPORTANT

The reel to cutterbar clearance should always be checked following adjustments to reel tine pitch and reel position.

Refer to Section 8.9.1 Reel Clearance to Cutterbar and, 8.9.2 Reel Frown Adjustment.

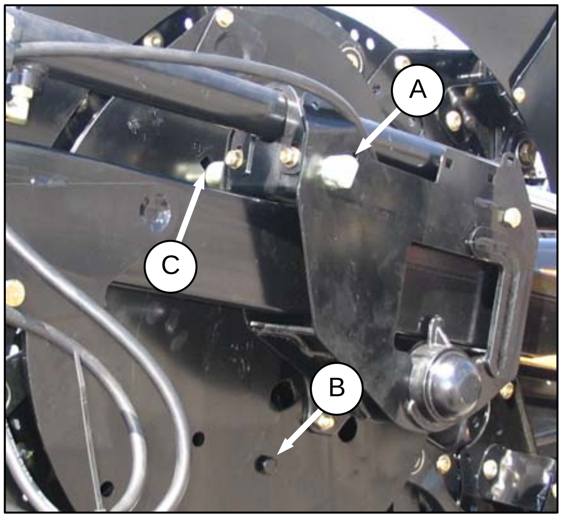
For detailed reel set-up information, refer to Section 7.11 HEADER SET-UP.

7.12.10.3 Cam Adjustment

WARNING

Stop windrower engine, and remove key before making adjustments to machine. A child or even a pet could engage the drive.

<u>D60</u>



D60

a. Using a ¾ in. wrench, turn the cam latch pin (A) counter clockwise to release the cam disc.

IMPORTANT

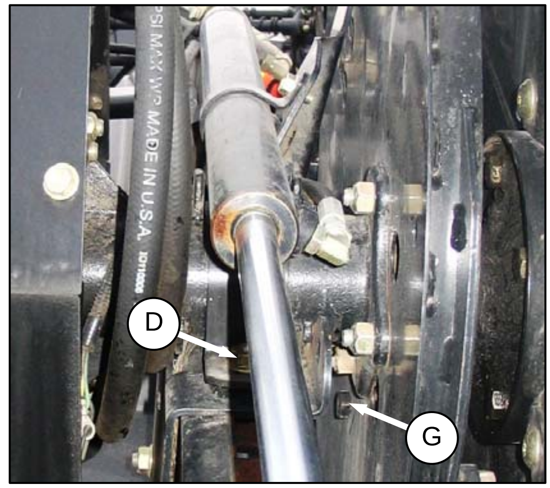
Turning the pin to the end of the ramp will lock the pin in the disengaged position. Turn pin clockwise to unlock it, and secure cam position before operating machine.

b. Use the wrench on bolt (B) to rotate cam disc so that the latch pin is aligned with the desired hole (**1 to 4**) at (C) in the cam disc.

c. Turn the latch pin (A) clockwise to engage and lock the cam disc.

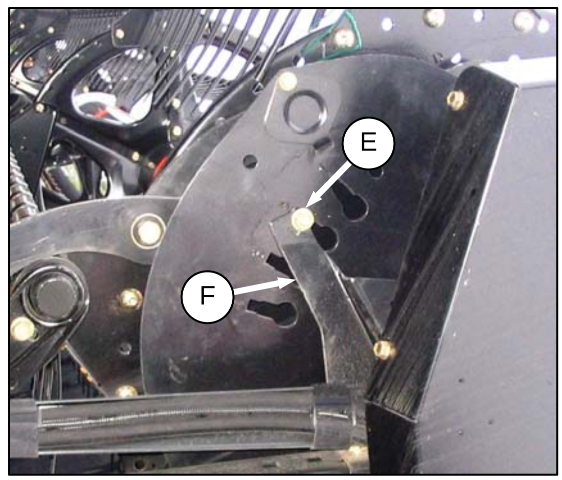
d. On a double reel, repeat above procedure at other arm where the second cam is located.

<u>D50</u>



D50

a. Loosen bolt (D) on clamp securing cam disc to reel arm.



D50

b. Loosen bolt (E) in cam slot, and rotate cam clockwise so that bolt disengages cam stop (F).

c. Remove bolt (E) from cam disc.

d. Rotate cam disc to desired position (use wrench on bolt head (G) if necessary).

e. Insert bolt head into numbered slot, and rotate cam disc so that bolt engages cam stop.

f. Tighten cam stop bolt (E), and clamping bolt (D).

g. Check reel clearance to cutterbar after making changes to cam setting. Refer to Section 8.9.1 Reel Clearance to Cutterbar and, 8.9.2 Reel Frown Adjustment for measurements and adjustment procedures.

7.12.11 CROP DIVIDERS AND RODS

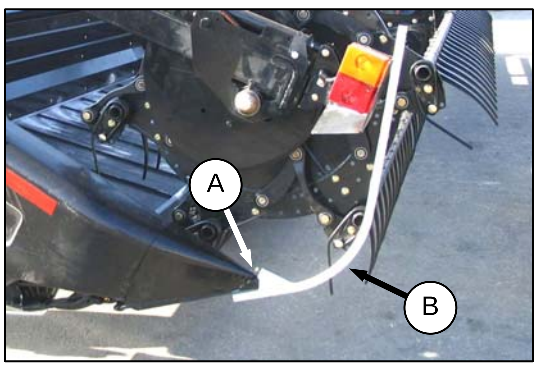
7.12.11.1 Divider Rods

The divider rods are removable. The rods are suitable when crop is running “down”, while the crop dividers without the rods are better in standing crops.

See the chart below for recommended divider rod use for various crops.

WITH DIVIDER RODS	WITHOUT DIVIDER RODS
Lodged Cereal Peas Lentils Canola Winter Forage Sudan Grass Flax Alfalfa Grass Seed Soybeans	Standing Cereal Edible Beans Soybeans Rice Milo

Remove divider rods as follows:



a. Loosen bolt (A) and remove rod (B).



b. Store both rods on the inboard side of the right endsheet.

7.12.11.2 Crop Dividers

The crop dividers are removable to suit installation of a vertical knife at each end of the header, and to decrease the transport width.

DANGER

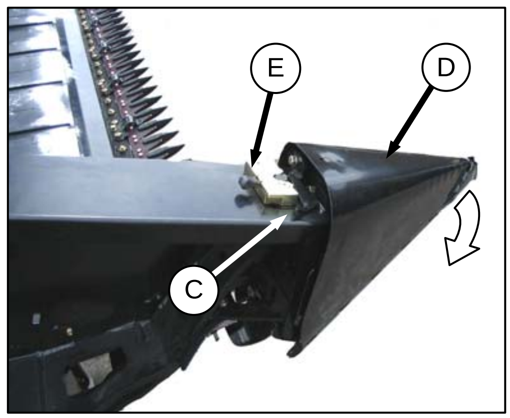
To avoid bodily injury or death from unexpected start-up or fall of raised machine, stop engine, remove key and engage lift cylinder stops before going under machine to remove crop dividers or for any reason.

7.12.11.2.1 Removal

<u>**D60**</u>

a. Raise header stop engine, remove key, and engage lift cylinder lockouts. Refer to Windrower Operator’s Manual.

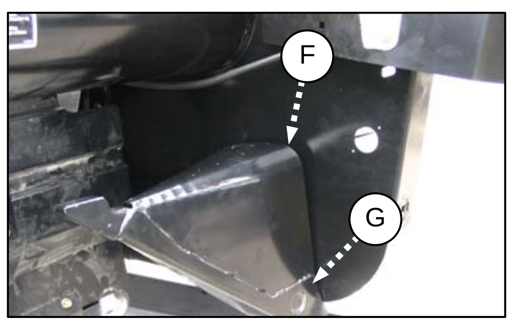
b. Open/remove header endshields. Refer to Section 8.4 ENDSHIELDS.



c. Lift safety lever (C).

d. Hold onto divider (D), push lever (E) to open latch and lower divider.

e. Lift divider off endsheet.



f. Locate pin (F) on divider in hole in endsheet at location shown. Lift divider and locate lugs (G) on divider into bracket on endsheet. Ensure lugs engage bracket.

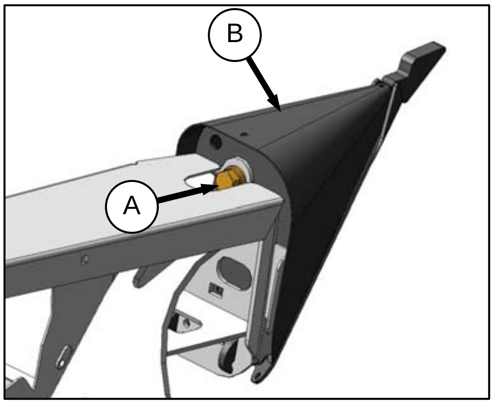
g. Replace header endshields.

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D50

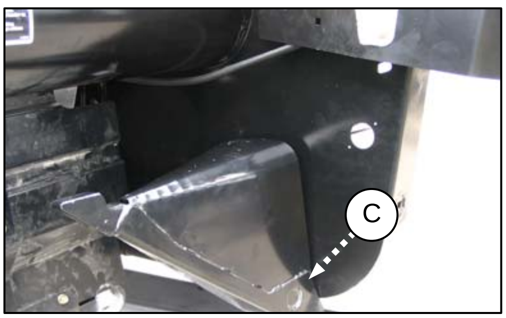
a. Raise header, stop engine, remove key, and engage lift cylinder lockouts. Refer to Windrower Operator's Manual.

b. Open/remove header endshields. Refer to Section 8.4 ENDSHIELDS.

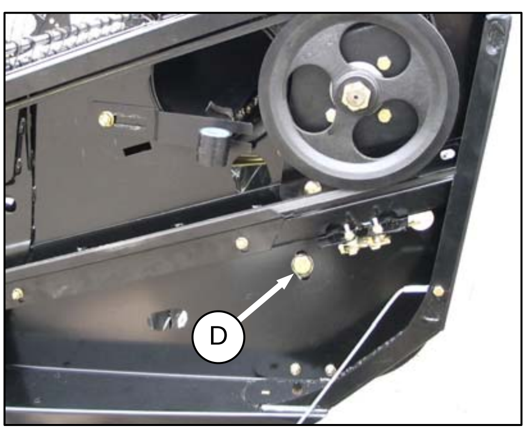


c. Remove bolt (A), lock-washer, and flat washer, and lower divider (B).

d. Lift divider off endsheet.



e. Hook lugs (C) on divider into slots on inboard side of endsheet.



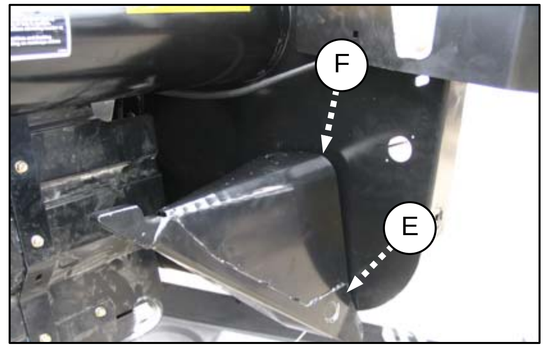
f. Install bolt (D), lock-washer, and flat washer to secure divider to endsheet.

g. Replace header endshields.

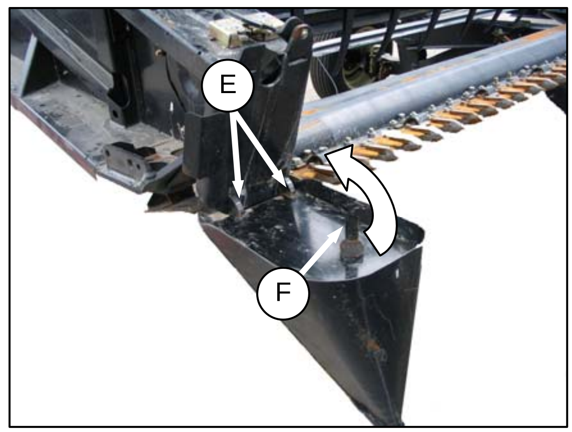
7.12.11.2.2 Installation

D60

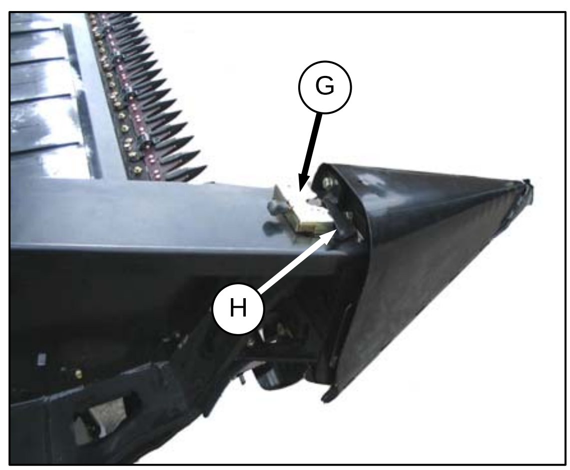
a. Open/remove header endshield.



b. At divider storage location, lift divider to disengage lugs (E) at lower end, and then lower it slightly to disengage pin (F) from endsheet.



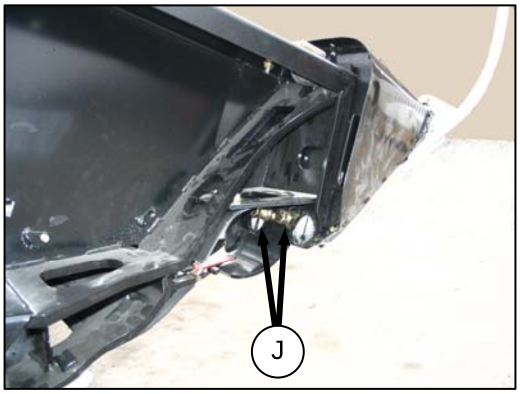
c. Position crop divider as shown by locating lugs (E) in holes in endsheet.



d. Lift forward end of divider until pin (F) at top of divider engages and closes latch (G).

e. Push safety lever (H) down" to lock pin in latch.

(continued next page)

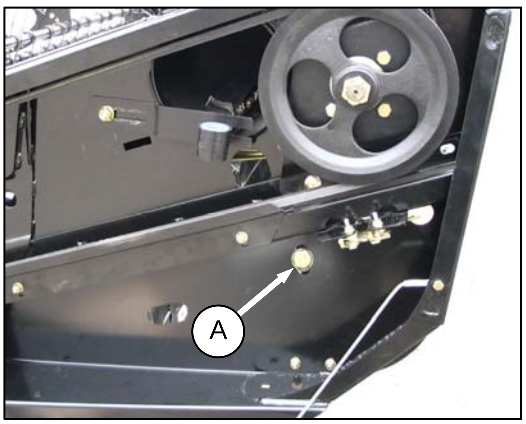


f. Check that divider does not move laterally. Adjust bolts (J) as required to tighten divider, and remove lateral play when pulling at divider tip.

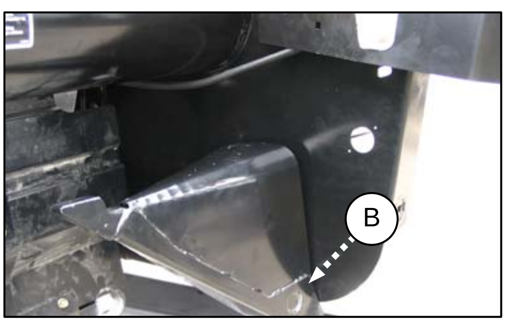
g. Replace endshields.

D50

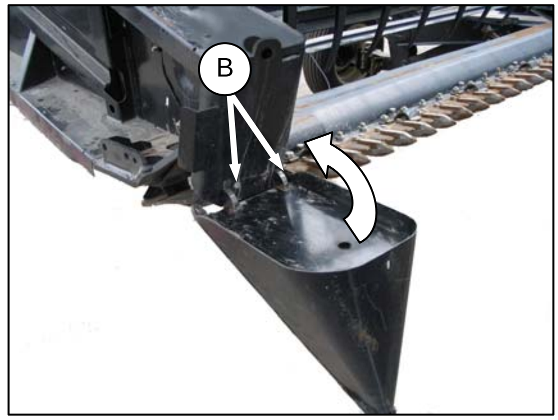
b. Open endshield.



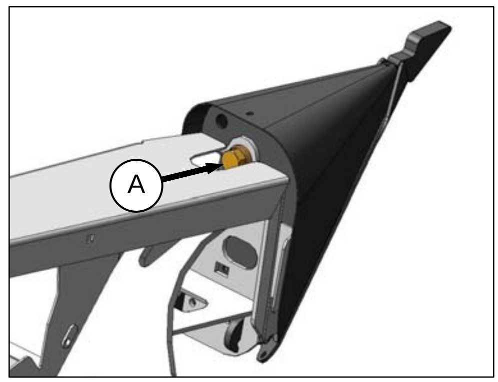
c. Remove bolt (A), lock-washer, and flat washer from inside of end sheet.



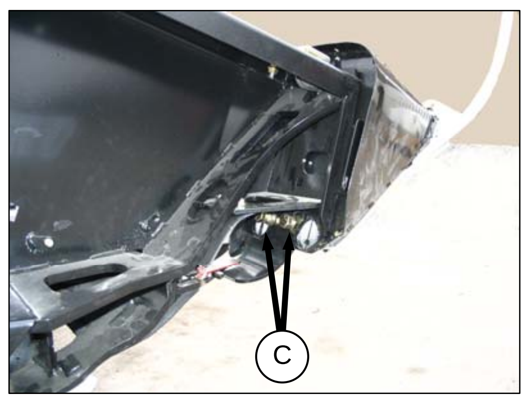
d. Lift crop divider to disengage lugs (B) from endsheet.



e. Position crop divider as shown by locating lugs (B) in holes in endsheet.



f. Lift forward end of divider and re-install bolt (A), lock-washer, and flat washer. Tighten bolt.



g. Check that divider does not move laterally. Adjust bolts (C) as required to tighten divider and remove lateral play when pulling at divider tip.

h. Close endshield.

7.13 DELIVERY OPENING/DECK SHIFT

The width and position of the delivery opening affects the width and configuration of the windrow.

The decision to widen or narrow the center delivery opening; or whether or not to double windrow should be based on the following factors:

- combine pick-up capability,
- type and yield of crop,
- weather conditions (rain, humidity, wind), and,
- drying time available.

Refer to Section 7.15 WINDROW TYPES for the strengths and weaknesses of the various windrow configurations with respect to these factors.

The 25 FT. to 40 FT. D60 Harvest Headers can lay double windrows by shifting the decks for delivery to either the right or left side of the header. Refer to Section 7.14 DOUBLE WINDROWING.

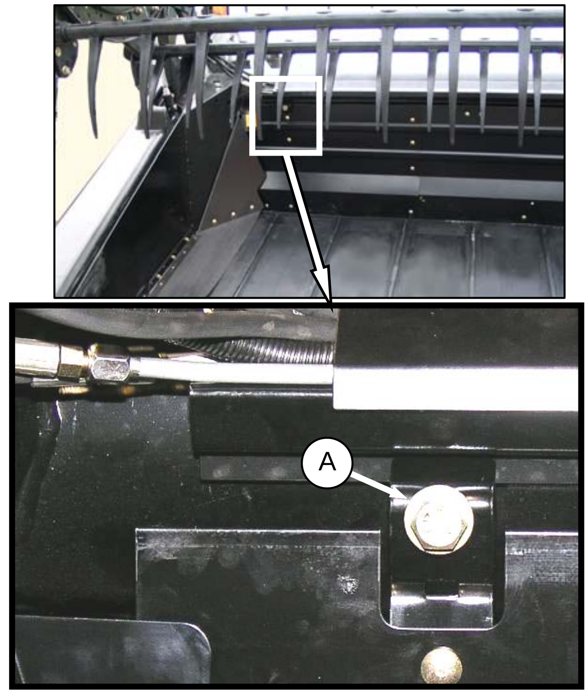
The D60 Harvest Headers with manual deck shift can also provide a range of windrow widths. Refer to Section 7.13.1 Delivery Opening - D60.

The D50 Harvest Header center delivery opening can be set to provide narrow, medium, and wide windrows. Refer to Section 7.13.2 Delivery Opening - D50.

7.13.1 DELIVERY OPENING - D60

Both decks can be positioned to vary the delivery opening from 60.61 to 69.7 in. (1540 to 1770 mm) for the 15 FT. header, and from 67.1 to 76.7 in. (1720 to 1950 mm) for 20 - 40 FT. models.

Adjust as follows:



a. Loosen bolts (A) on both decks.

b. Slide decks desired amount. Re-tighten bolts (A).

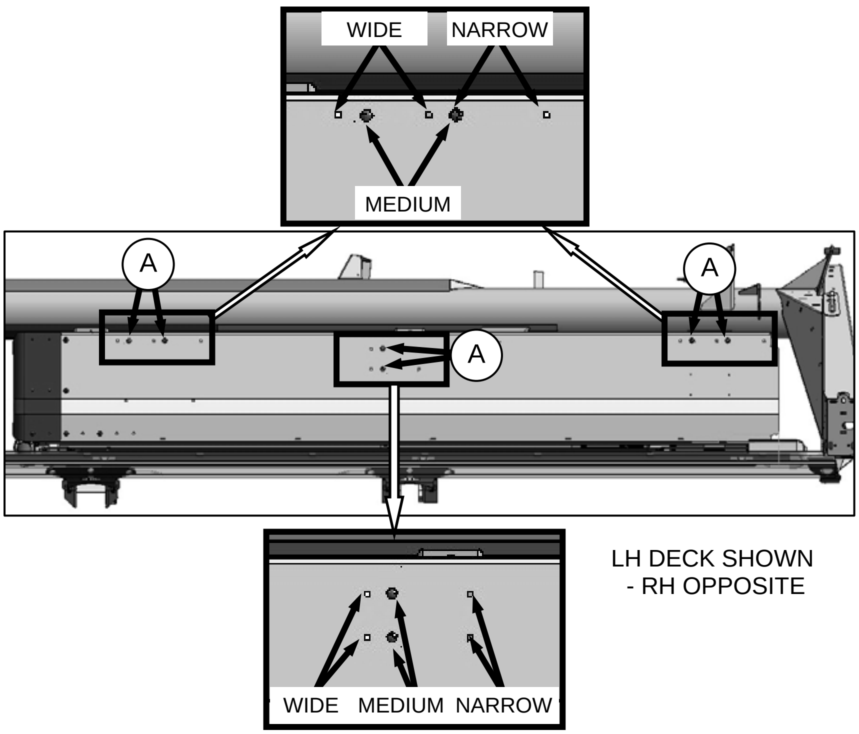
7.13.2 DELIVERY OPENING - D50

Both decks can be shifted manually ,and can be positioned to set the delivery opening at three widths;

- **WIDE** **76 in. (1925 mm)**
- **MEDIUM** **74 in. (1875 mm)**
- **NARROW** **67.5 in. (1715 mm)**

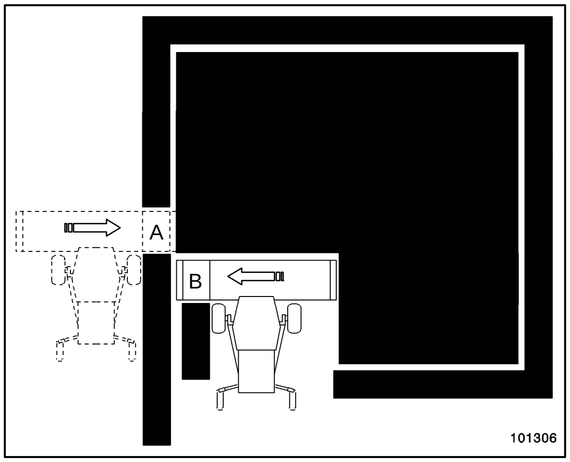
The decks are factory set at the "**MEDIUM**" width position.

Change opening as follows:



a. Remove six bolts (A) from backsheet, and move deck so that holes at desired opening width line up.
b. Re-install bolts (A), and tighten.
c. Repeat for other deck.

7.14 DOUBLE WINDROWING



The 25 FT. to 40 FT. D60 Harvest Headers double windrow capability allows cutting one round delivering to the right end (A), then shifting to left end delivery (B) and laying the second windrow beside the first.

NOTE

The end delivery opening size (67 in. (1710 mm)) is designed to give minimal clearance between the first windrow laid and the standing crop.

The center delivery opening size from the factory is 74 in. (1870 mm), with an adjustable range of 61 - 78 in. (1540 - 1970 mm).

NOTE

If end delivery with a 30 FT. header equipped with transport, crop can interfere with the outboard wheel. To rectify the problem, remove the outboard wheel.

Larger capacity combines or forage harvesters can then pick up twice as much material in a single pass - saving time and fuel.

The decks can be shifted manually or hydraulically.

7.14.1 HYDRAULIC DECK SHIFT

The hydraulic deck shift feature allows the Operator to select center, left, or right delivery from the windrower cab.

It is only available on the 25, 30, 35, and 40 FT. D60 Harvest Headers.

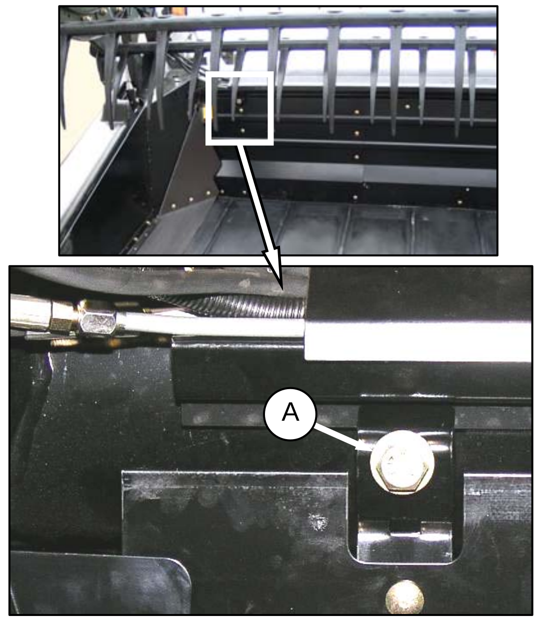
Refer to your Self-Propelled Windrower Operator's Manual for identification and operation of the deck shift control.

7.14.2 MANUAL DECK SHIFT

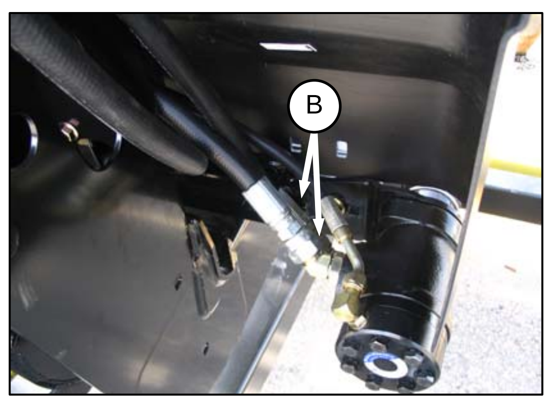
Both decks can be shifted manually, and can be positioned to deliver the crop from the right or left end, and the center.

WARNING

Stop windrower engine, and remove key before making adjustments to machine. A child or even a pet could engage the drive.



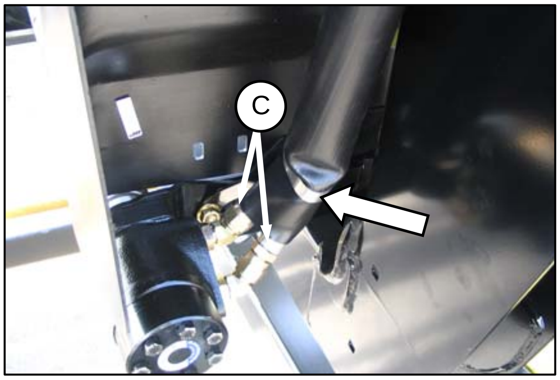
a. Loosen bolt (A) on the deck that is to be moved.
b. Slide deck to close off the center opening. Re-tighten bolt (A).



LEFT DECK MOTOR

c. Reverse the draper drive motor hoses (B) on the moved deck so that the draper turns the same direction as the existing deck.

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RIGHT DECK MOTOR

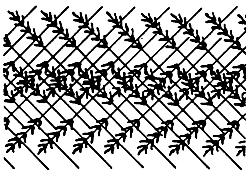
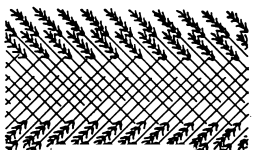
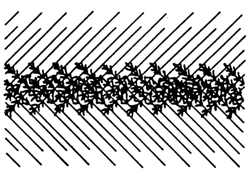
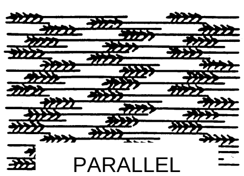
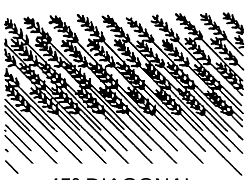
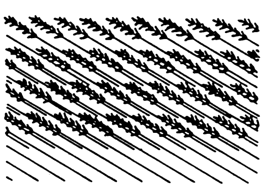
NOTE

If right deck is moved, loosen clamp on plastic sleeve at right deck drive motor so that hoses (C) can be reversed. Re-tighten clamp.

7.15 WINDROW TYPES

There are three basic criteria by which the quality of a windrow is measured:

- Weight Distribution - heads and stalks distributed evenly across full width of windrow.
- Good Curing - a loose, open windrow for better drying.
- Good Weatherability - a well-formed windrow that supports heads off the ground and holds together in extreme weather conditions.

WINDROW TYPE	DESCRIPTION	WEIGHT DISTRIBUTION	CURING	WEATHER-ABILITY	MACHINE SETTING GUIDELINES *
 HERRINGBONE	The most desirable form of windrow, stalks are crossed and interwoven. Heads are distributed across full width of windrow. This windrow can be formed by center delivery only.	GOOD	GOOD	EXCELLENT	Reel and ground speed approximately equal. Medium draper speed. Center Delivery
 FANTAIL	The stalk tips are crossed in the center, and heads are in line along outside edges. This windrow can be formed by center delivery only.	FAIR	FAIR	FAIR	Low draper speed. Low header angle. Center delivery.
 DOVETAIL	The stalk tips are lined along outside edges of windrow, and heads are crossed in center. This windrow can be formed by center delivery only.	POOR	FAIR	POOR	High draper speed. High header angle. Center delivery.
 PARALLEL	The stalks are parallel to windrow, and heads evenly distributed across width of windrow. This windrow can be formed by center delivery or end delivery.	GOOD	GOOD	GOOD	Medium draper speed. Medium header angle. Center or end delivery.
 45º DIAGONAL	The stalk tips are lined along one edge, and heads are along opposite edge, 45º to windrow perpendicular. This windrow can be formed by end delivery or by center delivery if the crop is leaning to one side.	POOR	FAIR	POOR	Low reel speed. Less aggressive tine pitch. End delivery or center delivery if crop is leaning.
 75º DIAGONAL	The stalks are closer to parallel than the 45º windrow. Stalk tips are lined along one edge with heads opposite, 75º to windrow perpendicular. This windrow can be formed by end delivery or by center delivery if the crop is leaning to one side.	FAIR	GOOD	FAIR	Low reel speed. Less aggressive tine pitch. End delivery or center delivery if crop is leaning.

7.16 HAYING TIPS

The following information may be useful when using the D50 and D60 Harvest Headers in hay crops:

7.16.1 CURING

a. A quick cure will maintain top quality because:
   - 5% of the protein is lost for each day hay lies on the ground,
   - The sooner the cut hay is off, the earlier the start for next growth.

b. Leaving the windrow as wide and thin as possible makes for the quickest curing

c. The cured hay should be baled as soon as possible.

7.16.2 TOPSOIL MOISTURE

a. On wet soil, the general rule of "wide and thin" does not apply. A narrower windrow will dry faster than hay left flat on wet ground.

b. When the ground is wetter than the hay, moisture from the soil is absorbed by the hay above it. Determine topsoil moisture level before cutting. Use a moisture tester or estimate level:

LEVEL	% MOISTURE	CONDITION
Wet	Over 45%	Soil is Muddy
Damp	25 - 45%	Shows Footprints
Dry	Under 25%	Surface is Dusty

c. If ground is wet due to irrigation, wait until soil moisture drops below 45%.

d. If ground is wet due to frequent rains, cut when weather allows, and let the forage lie on wet ground until it dries to the moisture level of the ground.

e. The cut hay will dry no more until the ground under it dries, so consider moving the windrow to drier ground.

7.16.3 WEATHER AND TOPOGRAPHY

a. Cut as much hay as possible by midday, when drying conditions are best.

b. Fields sloping south get up to 100% more exposure to the sun's heat than do north sloping fields.

   If hay is baled and chopped, consider baling the south facing fields, and chopping fields facing north.

c. When relative humidity is high, the evaporation rate is low, and hay dries slower.

d. If there is no wind, saturated air becomes trapped around the windrow. Raking or tedding will expose the hay to fresher, less saturated air.

e. Cutting hay perpendicular to the direction of the prevailing winds is also recommended.

7.16.4 WINDROW CONFIGURATION

It is recommended that a windrow with the following characteristics be produced. Refer to Section 7.12 HEADER OPERATING VARIABLES for instructions on adjusting the header.

CONFIGURATION	ADVANTAGE
High And Fluffy	The movement of air through the windrow is more important to the curing process than direct sunlight.
Consistent Formation, Not Bunchy	Permits an even flow of material into the baler, chopper etc. and allows for more even drying.
Even Distribution of Material Across Windrow	Results in even and consistent bales to minimize handling and stacking problems.
Properly Conditioned	Prevents excessive leaf damage.

7.16.5 DRIVING ON WINDROW

Driving on previously cut windrows can lengthen drying time by a full day in hay that will not be raked.

If practical, set forming shields for a narrower windrow that can be straddled.

NOTE

Driving on the windrow in high yielding crops may be unavoidable if a full width windrow is necessary.

7.16.6 RAKING AND TEDDING

Raking or tedding speeds up drying, however the benefits must be weighed against the additional leaf losses which will result.

There is little or no advantage to raking or tedding if the ground beneath the windrow is dry.

Large windrows on damp or wet ground should be turned over when they reach 40 - 50% moisture.

Hay should not be raked or tedded at less than 25% moisture, or excessive yield losses will result.

7.16.7 CHEMICAL DRYING AGENTS

Hay drying agents work by removing wax from legume surfaces, enabling water to escape and evaporate faster.

However, treated hay lying on wet ground will also absorb ground moisture faster.

Before deciding to use a drying agent, costs and benefits relative to your area should be carefully compared.

7.17 DRAPER DEFLECTORS

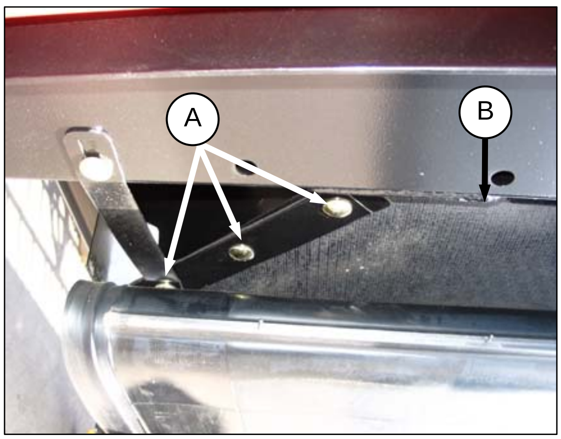
D60 single knife headers are equipped with rubber deflectors that are attached to the inboard side of the endsheets to prevent material from falling through the gap between the endsheet and the draper.

In some cases material hesitates on the deflectors, and will not flow onto the draper. Replace the existing deflector with a narrower one, or rework the existing deflector.

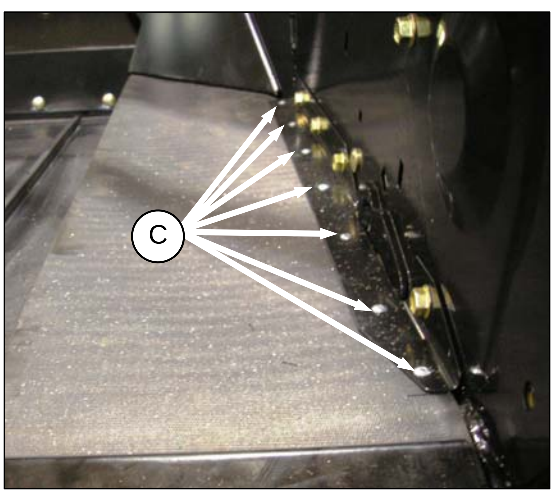
7.17.1 Deflector Replacement

a. Raise reel fully, and lower header to ground.

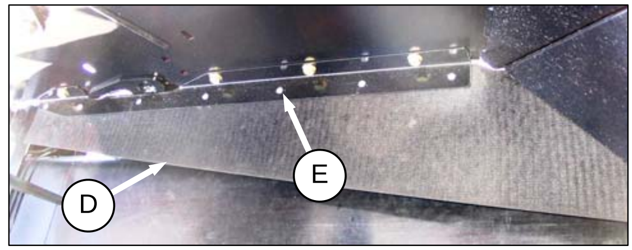
b. Stop engine, remove key, and engage reel props.



c. Remove the three carriage bolts (A) securing the aft end of the existing deflector (B) to the frame behind the backsheet.



d. Drill out the seven pop-rivets (C) along the endsheet, and remove the deflector.

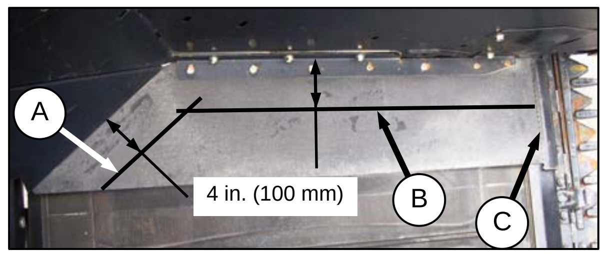


e. Position new deflector (part number 172381) (D) onto endsheet bracket, and attach with seven pop-rivets (part number 18768) (E).

f. Re-install the three carriage bolts (A) at aft end of deflector.

7.17.2 DEFLECTOR REWORK

Trim existing deflectors as follows:



a. Mark a straight line (A) on the deflector 4 in. (100 mm) from and parallel to the back edge of the deflector.

b. Mark another line (B) on the deflector 4 in. (100 mm) from and parallel to the endsheet.

c. Using a sharp knife, cut rubber deflector along the lines (A) and (B), taking care not to cut the draper underneath the deflector.

d. Cut the rubber deflector along the steel retainer (C) from the inboard edge up to line (B), and remove the excess rubber.



DEFLECTOR AFTER TRIMMING

e. Use the “cut-off” portion of deflector as a template to rework the deflector on the opposite end.

7.18 HEADER LEVELLING

The windrower linkages are factory set to provide the proper level for the header, and should not normally require adjustment. The float springs are **not** used to level the header.

If the header is not level, check the tire pressures on the windrower ensuring they are properly inflated. Refer to your Self-Propelled Windrower Operator's Manual.

If the header is still not level, then adjustment to the windrower linkages is required. Refer to the appropriate section in the Self-Propelled Windrower Operator's Manual.

7.19 UNPLUGGING CUTTERBAR

a. Stop forward movement of the machine, and disengage header drives.

b. With header on ground, back up several feet, and engage header drive clutch.

CAUTION

Lowering rotating reel on a plugged cutterbar will damage the reel components.

c. If plug does not clear, disengage header drive clutch and raise header fully.

WARNING

Stop engine, and remove key before removing plugged material from header. A child or even a pet could engage the drive.

d. Shut off engine, remove key, and engage park brake.

e. Engage header lift cylinder locks.

WARNING

Wear heavy gloves when working around sickle.

f. Clean off cutterbar by hand.

NOTE

If sickle plugging persists, see Section 9 TROUBLESHOOTING.

7.20 UPPER CROSS AUGER



The cross auger helps deliver very bulky crops across the header onto the windrow.

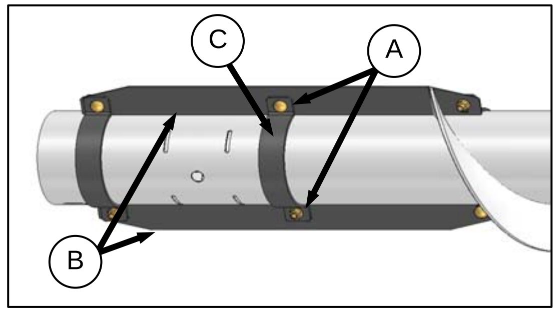
Removable beater bars assist in delivering material through the header opening.

If wrapping occurs, the beater bars can be removed as shown in the next column.

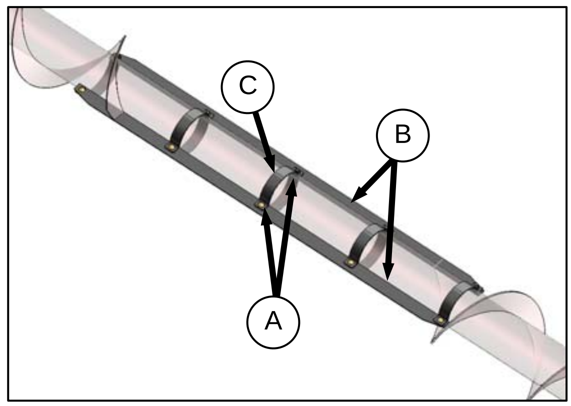
a. Lower header to ground, stop engine, and remove key.

WARNING

Stop engine, and remove key before removing plugged material from header. A child or even a pet could engage the drive.



DOUBLE REEL HEADERS



SINGLE REEL HEADERS

b. Remove bolts (A) securing bars (B) and clamps (C) to auger tubes, and remove bars and clamps.

To re-install the beater bars:

a. Locate one beater bar (B) with one clamp set (C) on auger tube, and loosely secure with carriage bolt (A) and nut. Bolt head must face direction of auger rotation.
b. Locate remaining clamp sets on tube, and loosely attach to beater bar with carriage bolts and nuts. Bolt heads must face direction of auger rotation.
c. Position second beater bar in clamps, and secure with carriage bolts and nuts.
d. Tighten bolts.

7.21 TRANSPORTING HEADER

WARNING

Do not drive windrower with header attached on a road or highway at night, or in conditions which reduce visibility, such as fog or rain. The width of the header may not be apparent under these conditions.

7.21.1 ON THE WINDROWER

CAUTION

- **Check local laws for width regulations and lighting or marking requirements before transporting on roads.**
- **Follow all recommended procedures in your Windrower Operator's Manual for transporting, towing etc.**
- **Disengage header drive clutch when travelling to and from the field.**
- **Before driving windrower on a roadway, be sure flashing amber lamps, red tail lamps and head lamps are clean and working properly. Pivot amber lamps for best visibility by approaching traffic. Always use these lamps on roads to provide adequate warning to other vehicles.**
- **Do not use field lamps on roads, they may confuse other drivers.**
- **Before driving on a roadway, clean slow moving vehicle emblem and reflectors. Adjust rear view mirror and clean windows.**
- **Lower the reel fully and raise header unless transporting in hills. Maintain adequate visibility and be alert for roadside obstructions, oncoming traffic and bridges.**
- **When travelling down hill, reduce speed and keep header at a minimum height. This provides maximum stability if forward motion is stopped for any reason. Raise header completely at bottom of grade to avoid contacting ground.**
- **Travel speed should be such that complete control and machine stability are maintained at all times.**

7.21.2 TOWING

Headers with the Slow Speed Transport/Stabilizer Wheel option can be towed behind a properly configured MacDon windrower or an agricultural tractor. Refer to the Windrower Operator's Manual.

7.21.2.1 Attaching Header To Towing Vehicle

CAUTION

To avoid bodily injury and/or machine damage caused by loss of control:

- **Do not tow with a vehicle weighing less than the header to ensure adequate braking performance and control.**
- **Do not use a pick-up truck to tow header. Use only an agricultural tractor, combine, or properly configured MacDon windrower.**
- **Ensure that reel is down and fully back on support arms to increase header stability in transport. For headers with hydraulic reel fore-aft, never connect the fore-aft couplers to each other. This would complete the circuit and allow the reel to creep forward in transport, resulting in instability.**
- **Check that all pins are properly secured in transport position at wheel supports, hitch and cutterbar support.**
- **Check tire condition and pressure prior to transporting.**
- **Connect hitch to towing vehicle with a proper hitch pin with a spring locking pin or other suitable fastener.**
- **Attach hitch chain to towing vehicle. Adjust chain length to remove all slack except what is needed for turns.**
- **Connect header wiring harness 7-pole plug to mating receptacle on towing vehicle. (The 7-pole receptacle is available from your MacDon Dealer parts department).**
- **Ensure lights are functioning properly, and clean the slow moving vehicle emblem and other reflectors. Use flashing warning lights unless prohibited by law.**

7.21.2.2 Towing The Header

CAUTION

THIS IS INTENDED AS SLOW SPEED TRANSPORT.

CAUTION

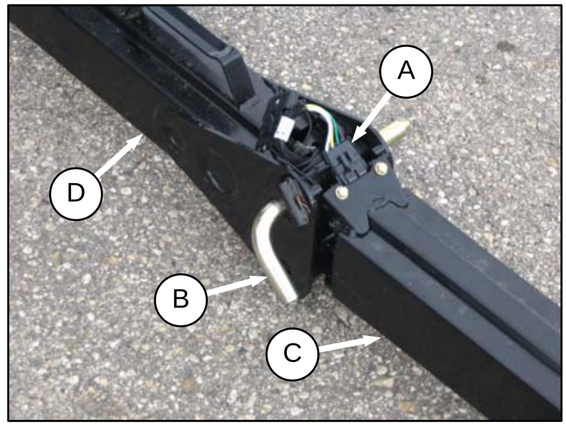
To avoid bodily injury and or machine damage caused by loss of control:

- **Do not exceed 25 mph (40 km/h). Reduce transport speed for slippery or rough conditions.**
- **Turn corners only at very low speeds (5 mph (8 km/h) or less). While cornering, header stability is reduced as front wheel moves to the left.**
- **Do not accelerate when making or coming out of a turn.**
- **Obey all highway traffic regulations in your area when transporting on public roads. Use flashing amber lights unless prohibited by law.**

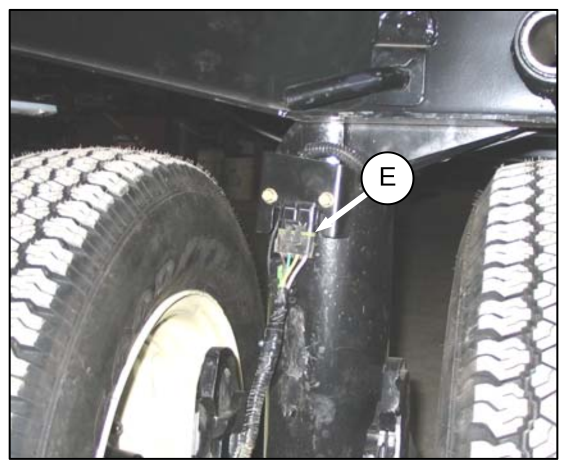
7.21.3 CONVERTING FROM TRANSPORT TO FIELD POSITION

a. Block the tires to prevent header rolling, and unhook from towing vehicle.

b. Remove tow-bar as follows:

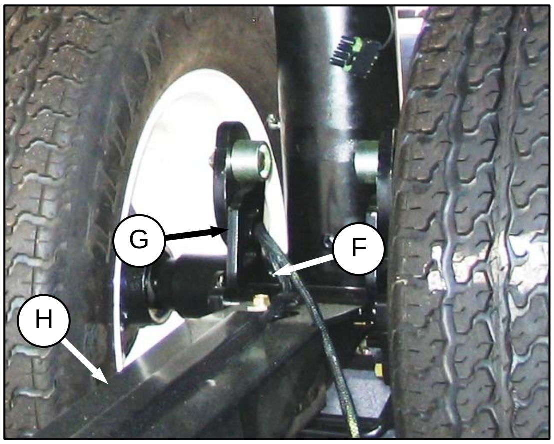


1. Disconnect wiring connector (A) on tow-bar.
2. Remove pin (B) from tow-bar, and disassemble forward section (C) from aft section (D).



3. Disconnect wiring connector (E) at front wheel.

(continued next page)



4. Remove clevis pin (F), and set aside for later installation.
5. Push latch (G), and lift tow-bar (H) from hook. Release latch.

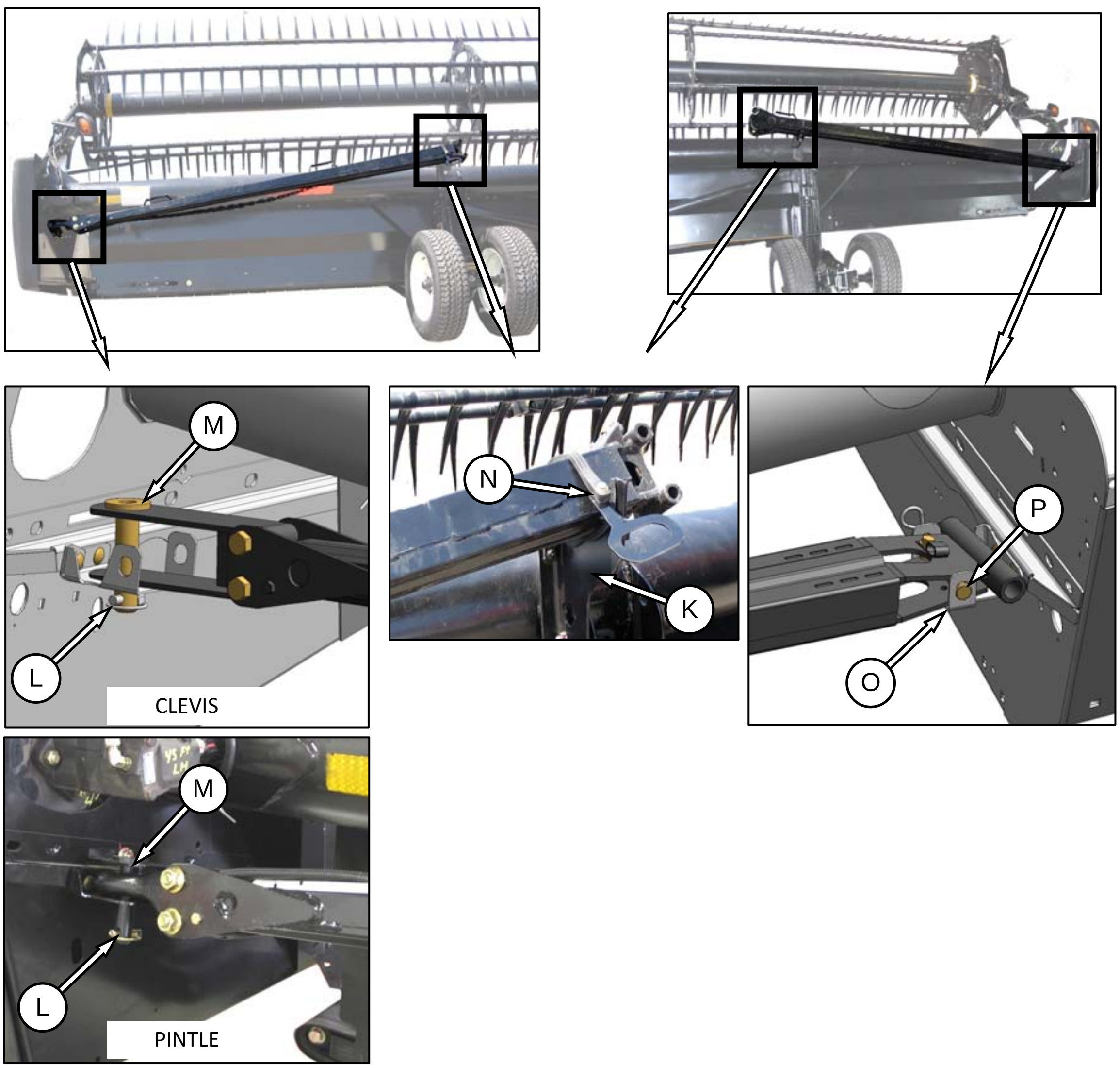
c. Store tow-bar on header as follows:

1. Locate larger end of one section of tow-bar in cradle (K) on header back-tube.
2. For clevis end of tow-bar, secure in support (L) on endsheet with hitch pin (M). Secure with lynch pin.
3. Install rubber strap (N) on cradle.
4. Similarly locate other section of tow-bar in cradle at other end of header.
5. Secure tube end in support (O) with clevis pin (P). Secure with hairpin.
6. Install rubber strap (N) on cradle.

d. Attach header to power unit. Refer to Windrower Operator's Manual.

IMPORTANT

Carrying the tow-bar on the header will affect the header float. Refer to Section 7.12.2 Header Float for adjustment procedures.



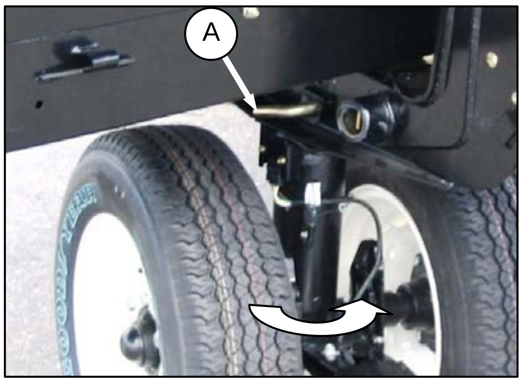
7.21.3.1 Front Wheels To Field

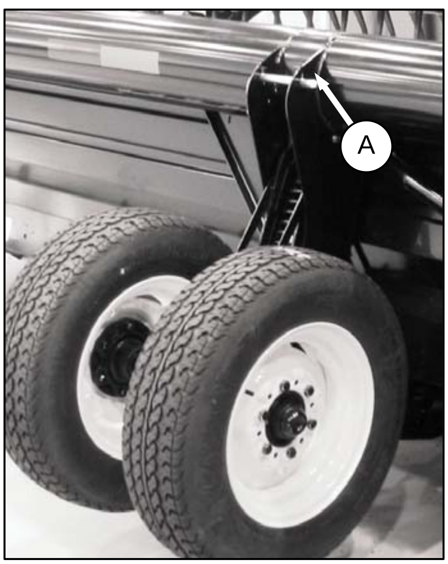
DANGER

To avoid bodily injury or death from unexpected start-up or fall of raised header, stop engine, remove key and engage header lift cylinder stops before going under header for any reason.

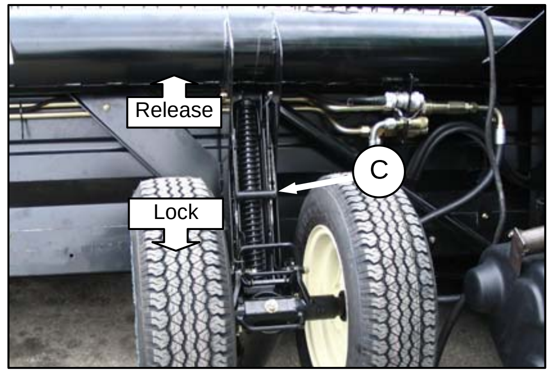
a. Raise header fully.

b. Swivel the wheel assembly so that wheels are aligned with lower frame.



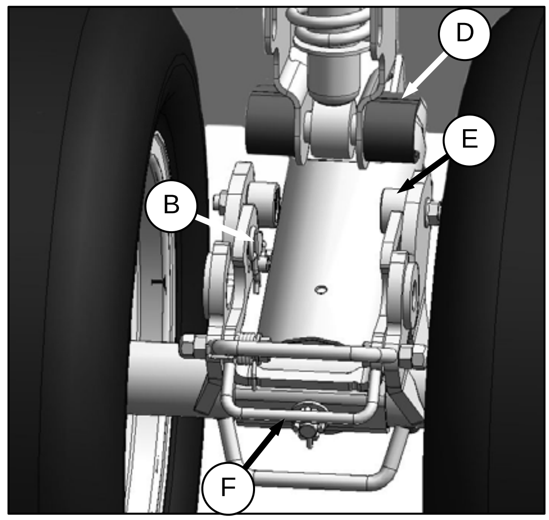


c. Remove pin (A), and pull wheel assembly towards rear of header. Store pin (A) in hole at top of leg.



TRANSPORT TO FIELD - FRONT WHEELS

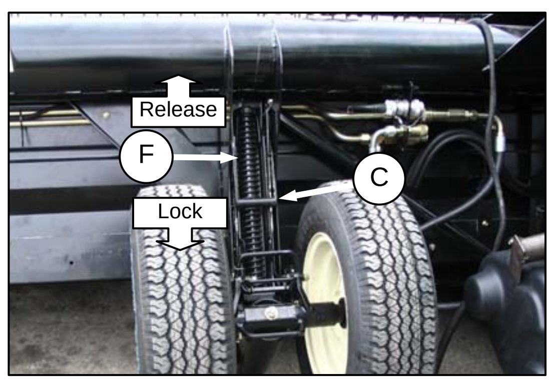
d. Pull handle (C) to release and lower the linkage.



TRANSPORT TO FIELD - FRONT WHEELS

e. Align lift hook (D) with lug (E), and lift wheel assembly to engage pin in hook. Ensure latch (F) is engaged.

f. Install clevis pin (B), and secure with hairpin.

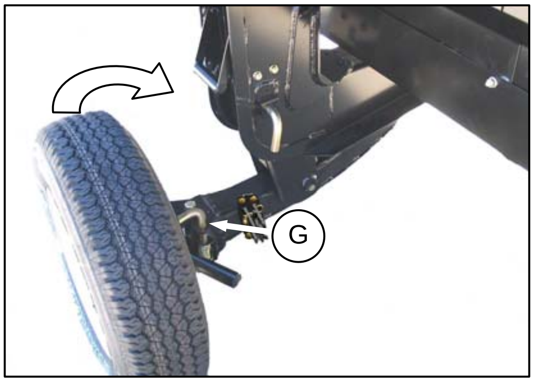


TRANSPORT TO FIELD - FRONT WHEELS

g. Lift wheel assembly to desired height, and slide linkage (F) into appropriate slot in vertical support.

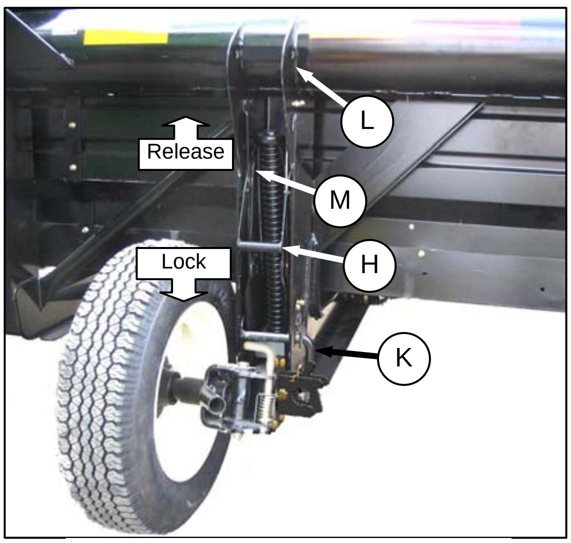
h. Push “down” on handle (C) to lock.

7.21.3.2 Rear Wheels To Field



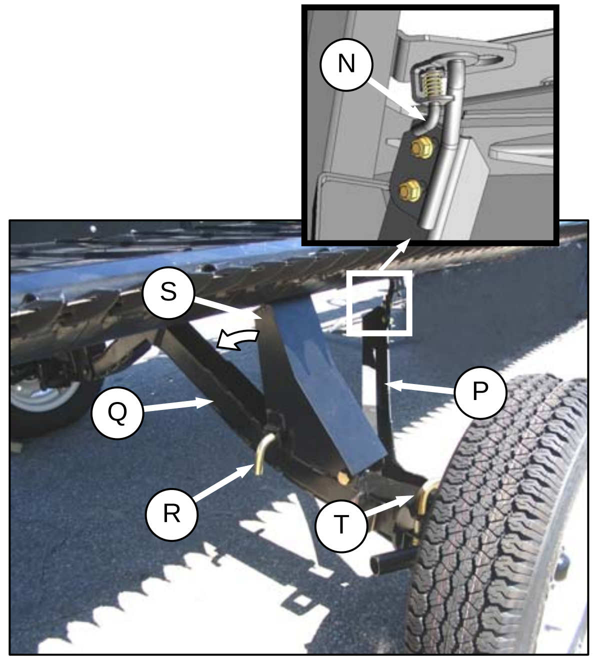
TRANSPORT TO FIELD - LH WHEEL

a. Pull pin (G) at left wheel, swivel wheel clockwise, and lock with pin (G).



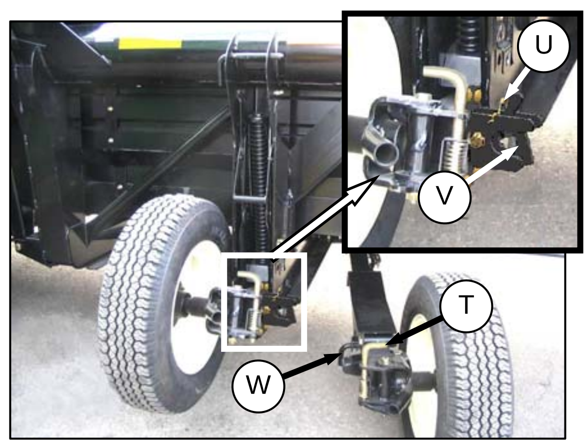
TRANSPORT TO FIELD - LH WHEEL

b. Remove pin at (K). Store pin at (L) as shown.
c. Pull handle (H) to release.
d. Lift wheel to desired height, and engage support channel into slot (M) in upper support.
e. Push down on handle (H) to lock.



TRANSPORT TO FIELD - RH WHEEL

f. At right cutterbar wheel, pull pin (N) on brace (P), disengage brace from cutterbar, and lower the brace against axle (Q).
g. Remove pin (R), lower the support (S) onto axle, and re-insert pin into support.
h. Swing axle clockwise to rear of header.



TRANSPORT TO FIELD - RH SIDE

i. Pull pin (T) at right wheel, swivel wheel counter clockwise to position shown, and lock with pin.
j. Remove hairpin (U) from latch (V).
k. Lift wheel, lift latch (V) and engage lug (W) onto left axle. Ensure latch closes.
l. Secure latch with hairpin (U).

(continued next page)

IMPORTANT
Check that wheels are locked, and that handle is in “locked” position.



FIELD POSITION - LH SIDE



FIELD POSITION - RH SIDE

m. The conversion is complete when the wheels are as shown.

7.21.4 CONVERTING FROM FIELD TO TRANSPORT POSITION

Raise header fully, and proceed as follows:

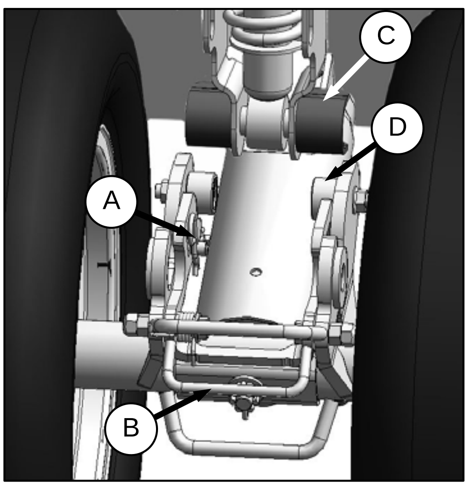
DANGER

To avoid bodily injury or death from unexpected start-up or fall of raised header, stop engine, remove key, and engage header lift cylinder stops before going under header for any reason.

7.21.4.1 Left Wheels To Transport

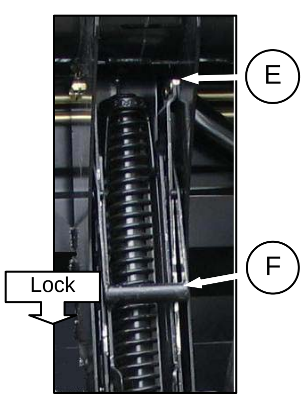
CAUTION

Stand clear of wheels, and release linkage carefully as wheels will drop once the mechanism is released.



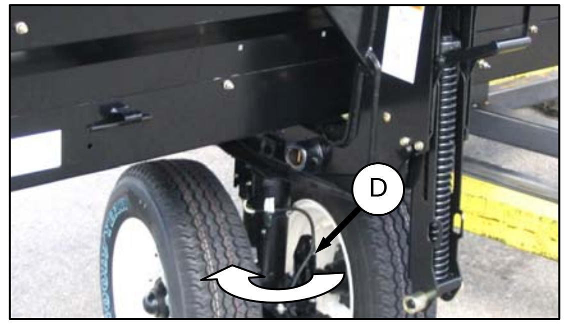
FIELD TO TRANSPORT - LH SIDE

a. Remove clevis pin (A).
b. Pull latch handle (B), and disengage link (C) from lug (D) to lower wheels.

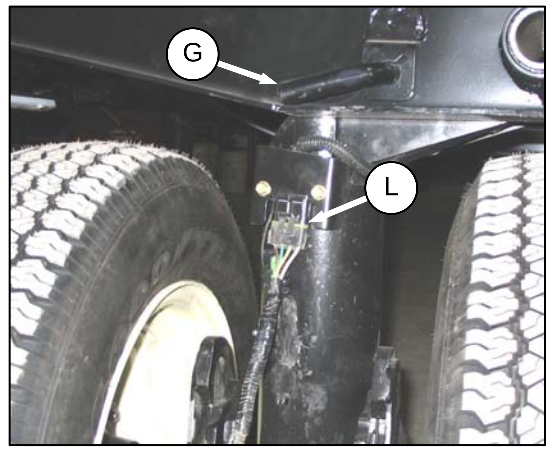


FIELD TO TRANSPORT - LH SIDE

c. Place suspension assembly in "full upward" location (E) in leg, and lower handle (F) to lock.

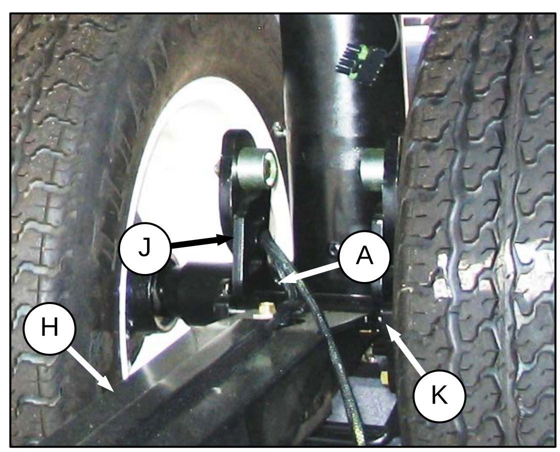


FIELD TO TRANSPORT - LH SIDE



FIELD TO TRANSPORT - LH SIDE

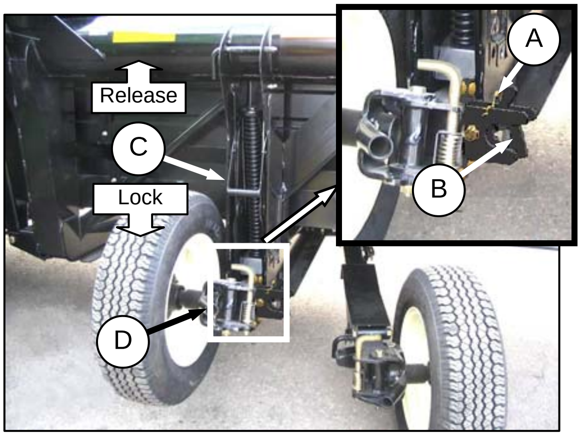
d. Remove pin (G) from storage at top of leg, move and swivel wheels clockwise so that lug (D) faces forward.
e. Insert pin (G), and turn pin to lock.



FIELD TO TRANSPORT - LH SIDE

f. Locate tow-bar (H) onto axle, and push against latch (J) until tow-bar pins drop into hooks (K).
g. Check that latch (J) has engaged tow-bar.
h. Install clevis pin (A), and secure with hairpin.
i. Connect plug (L) for lights.

7.21.4.2 Right Side Wheels To Transport



FIELD TO TRANSPORT - RH SIDE

a. At wheels at the right end of header, remove hairpin (A) from latch.

b. Lift latch (B), disengage right axle, and lower to ground.

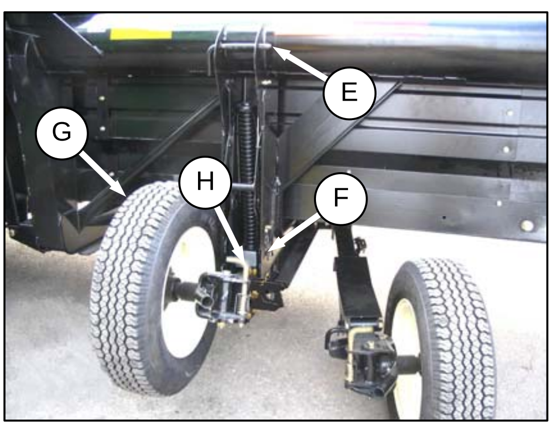
CAUTION

Stand clear of wheels and release linkage carefully as wheels will drop once the mechanism is released.

c. Carefully pull handle (C) to release the spring, and let the wheel drop to the ground.

d. Lift wheel and linkage with handle (D), and position linkage in second slot from bottom.

e. Lower handle (C) to lock.



FIELD TO TRANSPORT - RH SIDE

f. Remove pin (E), and install at (F) to secure linkage. Turn pin (E) to lock.

g. To position the left wheel (G), pull pin (H), swivel wheel counter clockwise, and re-lock with pin (H).



FIELD TO TRANSPORT - LH WHEEL

h. Left wheel is now in transport position as shown in illustration.



FIELD TO TRANSPORT - RH SIDE

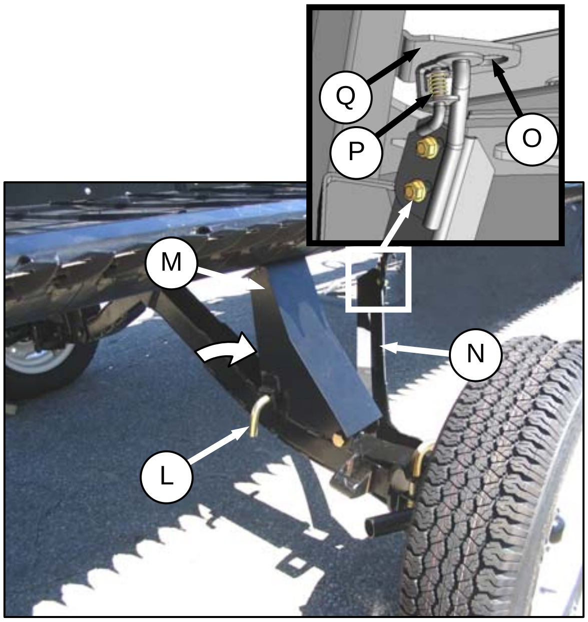
i. Pull pin (J), swivel wheel clockwise as shown, and lock with pin (J).



FIELD TO TRANSPORT - RH SIDE

j. Swivel the right axle (K) to front of header.

(continued next page)



TRANSPORT POSITION - RH WHEEL

k. Remove pin (L), raise support (M) to position shown, and re-insert pin (L).

IMPORTANT

Ensure pin (L) engages the tube on the axle.

l. Swing brace (N) into position as shown, and insert brace into slot (O) behind cutterbar. Position brace so that pin (P) engages hole in bracket (Q).

m. Right side wheel is now in transport position.

7.22 STORAGE

Do the following at the end of each operating season:

a. Clean the header thoroughly.

CAUTION

Never use gasoline, naphtha or any volatile material for cleaning purposes. These materials may be toxic and/or flammable.

CAUTION

Cover cutterbar and sickle guards to prevent injury from accidental contact.

b. Store the machine in a dry, protected place if possible. If stored outside, always cover with a waterproof canvas or other protective material.

c. If machine is stored outside, remove drapers and store in a dark, dry place.

NOTE

If drapers are not removed, store header with cutterbar lowered so water/snow will not accumulate on drapers. This accumulation of weight puts excessive stress on drapers and header

d. Lower header onto blocks to keep cutterbar off the ground.

e. Lower reel completely. If stored outside, tie reel to frame to prevent rotation caused by wind.

f. Repaint all worn or chipped painted surfaces to prevent rust.

g. Loosen drive belts.

h. Lubricate the header thoroughly, leaving excess grease on fittings to keep moisture out of bearings. Apply grease to exposed threads, cylinder rods and sliding surfaces of components. Oil sickle components to prevent rust.

i. Check for worn or broken components, and repair or order replacements from your MacDon Dealer. Attention to these items right away will save time and effort at beginning of next season.

j. Replace or tighten any missing or loose hardware. Refer to Section 8.3.1 Recommended Torques.

8 MAINTENANCE AND SERVICING

The following instructions are provided to assist the Operator in the use of the header.

Detailed maintenance, service, and parts information are contained in the Service Instruction Manual, and the Parts Catalog that are available from your MacDon Dealer.

8.1 PREPARATION FOR SERVICING

CAUTION

To avoid personal injury, before servicing header or opening drive covers:

- **Fully lower the header. If necessary to service in the raised position, always engage lift cylinder stops.**
- **Stop engine, and remove key.**
- **Engage park brake.**
- **Wait for all moving parts to stop.**

8.2 RECOMMENDED SAFETY PROCEDURES

- **Park on level surface when possible. Block wheels securely if windrower is parked on an incline. Follow all recommendations in your Windrower Operator's Manual.**
- **Wear close-fitting clothing and cover long hair. Never wear dangling items such as scarves or bracelets.**
- **Wear protective shoes with slip-resistant soles, a hard hat, protective glasses or goggles and heavy gloves.**
- **If more than one person is servicing the machine at the same time, be aware that rotating a driveline or other mechanically driven component by hand (for example, accessing a lube fitting) will cause drive components in other areas (belts, pulleys, and sickle) to move. Stay clear of driven components at all times.**
- **Be prepared if an accident should occur. Know where the first aid kit and fire extinguishers are located and how to use them.**
- **Keep the service area clean and dry. Wet or oily floors are slippery. Wet spots can be dangerous when working with electrical equipment. Be sure all electrical outlets and tools are properly grounded.**
- **Use adequate light for the job at hand.**
- **Replace all shields removed or opened for service.**
- **Use only service and repair parts made or approved by the equipment manufacturer. Substituted parts may not meet strength, design or safety requirements.**
- **Keep the machine clean. Never use gasoline, naphtha or any volatile material for cleaning purposes. These materials may be toxic and/or flammable.**

8.3 MAINTENANCE SPECIFICATIONS

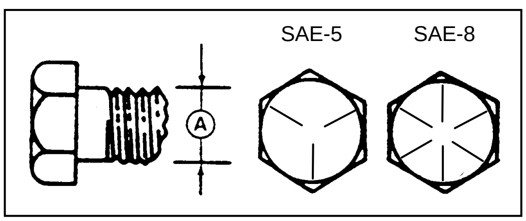
8.3.1 RECOMMENDED TORQUES

- Tighten all bolts to the torques specified in chart, unless otherwise noted throughout this manual.
- Check tightness of bolts periodically, using bolt torque chart as a guide.
- Replace hardware with the same strength bolt.
- Torque figures are valid for non-greased or non-oiled threads and heads unless otherwise specified. Do not grease or oil bolts or capscrews unless specified in this manual.
- When using locking elements, increase torque values by 5%.

8.3.1.1 SAE Bolts

BOLT DIA. "A" in.	NC BOLT TORQUE*			
	SAE-5		SAE-8	
	lbf·ft	N·m	lbf·ft	N·m
1/4	9	12	11	15
5/16	18	24	25	34
3/8	32	43	41	56
7/16	50	68	70	95
1/2	75	102	105	142
9/16	110	149	149	202
5/8	150	203	200	271
3/4	265	359	365	495
7/8	420	569	600	813
1	640	867	890	1205

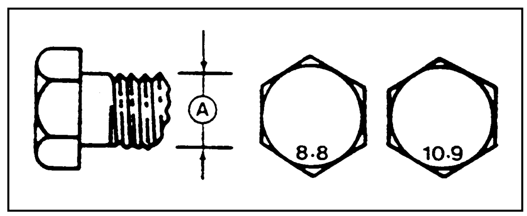
* Torque categories for bolts and capscrews are identified by their head markings.



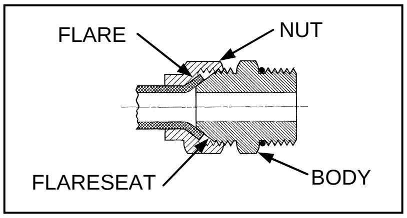
8.3.1.2 Metric Bolts

BOLT DIA. "A"	STD COARSE BOLT TORQUE*			
	8.8		10.9	
	lbf·ft	N·m	lbf·ft	N·m
M3	0.4	0.5	1.3	1.8
M4	2.2	3	3.3	4.5
M5	4	6	7	9
M6	7	10	11	15
M8	18	25	26	35
M10	37	50	52	70
M12	66	90	92	125
M14	103	140	148	200
M16	166	225	229	310
M20	321	435	450	610
M24	553	750	774	1050
M30	1103	1495	1550	2100
M36	1917	2600	2710	3675

* Torque categories for bolts and capscrews are identified by their head markings.



8.3.1.3 Flare Type Hydraulic Fittings

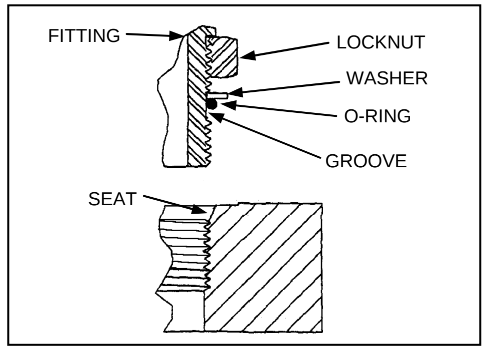


a. Check flare and flare seat for defects that might cause leakage.
b. Align tube with fitting before tightening.
c. Lubricate connection, and hand-tighten swivel nut until snug.
d. To prevent twisting the tube(s), use two wrenches. Place one wrench on the connector body, and with the second, tighten the swivel nut to the torque shown.

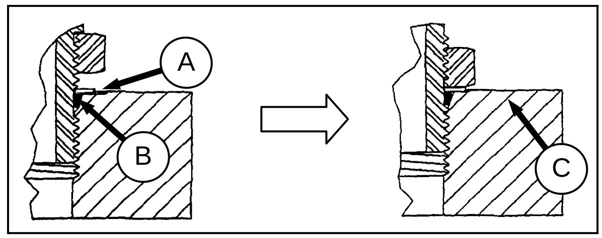
SAE NO.	TUBE SIZE O.D. (in.)	THD SIZE (in.)	NUT SIZE ACROSS FLATS (in.)	TORQUE VALUE*		RECOMMENDED TURNS TO TIGHTEN (AFTER FINGER TIGHTENING)	
				ft·lbf	N·m	Flats	Turns
3	3/16	3/8	7/16	6	8	1	1/6
4	1/4	7/16	9/16	9	12	1	1/6
5	5/16	1/2	5/8	12	16	1	1/6
6	3/8	9/16	11/16	18	24	1	1/6
8	1/2	3/4	7/8	34	46	1	1/6
10	5/8	7/8	1	46	62	1	1/6
12	3/4	1-1/16	1-1/4	75	102	3/4	1/8
14	7/8	1-3/16	1-3/8	90	122	3/4	1/8
16	1	1-5/16	1-1/2	105	142	3/4	1/8

* The torque values shown are based on lubricated connections, as in re-assembly.

8.3.1.4 O-ring Type Hydraulic Fittings



a. Inspect O-ring and seat for dirt or obvious defects.



b. On angle fittings, back off the lock nut until washer (A) bottoms out at top of groove (B) in fitting.
c. Hand-tighten fitting until back-up washer (A), or washer face (if straight fitting), bottoms on part face (C), and O-ring is seated.
d. Position angle fittings by unscrewing no more than one turn.
e. Tighten straight fittings to torque shown.
f. Tighten angle fittings to torque shown in the following table, while holding body of fitting with a wrench.

SAE NO.	THD SIZE (in.)	NUT SIZE ACROSS FLATS (in.)	TORQUE VALUE*		RECOMMENDED TURNS TO TIGHTEN (AFTER FINGER TIGHTENING)	
			ft·lbf	N·m	Flats	Turns
3	3/8	1/2	6	8	3	3/8
4	7/16	9/16	9	12	4	7/16
5	1/2	5/8	12	16	5	1/2
6	9/16	11/16	18	24	6	9/16
8	3/4	7/8	34	46	8	3/4
10	7/8	1	46	62	10	7/8
12	1-1/16	1-1/4	75	102	12	1-1/16
14	1-3/16	1-3/8	90	122	14	1-3/16
16	1-5/16	1-1/2	105	142	16	1-5/16
20	1-5/8	1-7/8	140	190	20	1-5/8
24	1-7/8	2-1/8	160	217	24	1-7/8

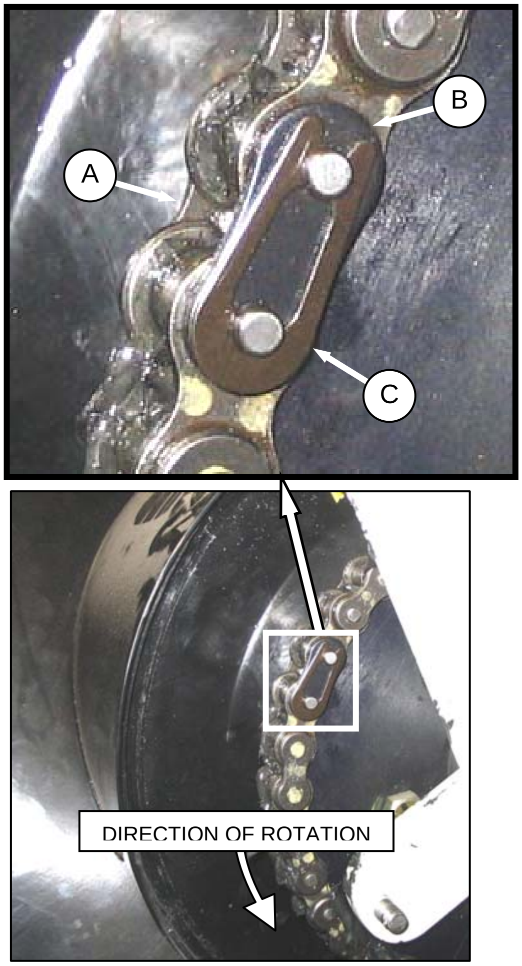
* The torque values shown are based on lubricated connections, as in re-assembly.

8.3.2 ROLLER CHAIN INSTALLATION

CAUTION

Stop engine, and remove key from ignition before leaving Operator's seat for any reason. A child or even a pet could engage an idling machine.

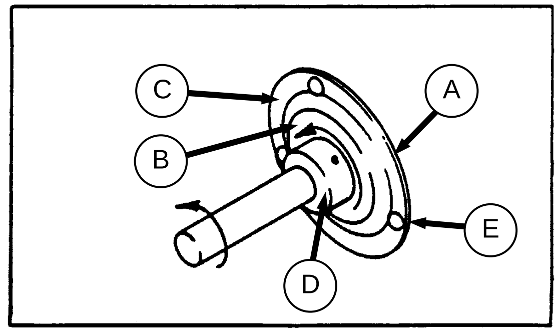
a. Locate ends of chain on sprocket.



b. Install pin connector (A) into chain, preferably from the sprocket backside.
c. Install connector (B) onto pins.
d. Install spring clip (C) onto front pin (D) with closed end of clip in direction of sprocket rotation.
e. Locate one leg of clip in groove of aft pin (E).
f. Press other leg of spring clip over face of aft pin (E) until it slips into groove. Do not press clip lengthwise from closed end.
g. Ensure clip is seated in grooves of pins.

8.3.3 SEALED BEARING INSTALLATION

a. Clean shaft, and coat with rust preventative.



b. Install flangette (A), bearing (B), second flangette (C), and lock collar (D).

NOTE

The locking cam is only on one side of the bearing.

c. Install (but do not tighten) the flangette bolts (E).
d. When the shaft is correctly located, lock the lock collar with a punch.

NOTE

The collar should be locked in the same direction the shaft rotates. Tighten the set screw in the collar.

e. Tighten the flangette bolts.
f. Loosen the flangette bolts on the mating bearing "one turn", and re-tighten. This will allow the bearing to line up.

8.3.4 RECOMMENDED FLUIDS AND LUBRICANTS

Your machine can operate at top efficiency only if clean lubricants are used.

- Use clean containers to handle all lubricants.
- Store in an area protected from dust, moisture, and other contaminants.

LUBRICANT	SPEC.	DESCRIPTION	USE	CAPACITIES
Grease	SAE Multi-Purpose	High Temperature Extreme Pressure (EP2) Performance With 1% Max Molybdenum Disulphide (NLGI Grade 2) Lithium Base	As Required Unless Otherwise Specified.	---
Gear Lubricant	SAE 85W-140	API Service Class GL-5	Wobble Box	2.3 quarts (2.2 liters)

8.3.5 CONVERSION CHART

QUANTITY	INCH-POUND UNITS		FACTOR	SI UNITS (METRIC)	
	UNIT NAME	ABBR.		UNIT NAME	ABBR.
Area	acres	acres	x 0.4047 =	hectares	ha
Flow	US gallons per minute	gpm	x 3.7854 =	liters per minute	L/min
Force	pounds force	lbf	x 4.4482 =	Newtons	N
Length	inch	in.	x 25.4 =	millimeters	mm
	foot	ft	x 0.305 =	meters	m
Power	horsepower	hp	x 0.7457 =	kilowatts	kW
Pressure	pounds per square inch	psi	x 6.8948 =	kilopascals	kPa
			x .00689 =	megapascals	MPa
Torque	pound feet or foot pounds	lbf·ft or ft·lbf	x 1.3558 =	newton meters	N·m
	pound inches or inch pounds	lbf·in. or in·lbf	x 0.1129 =	newton meters	N·m
Temperature	degrees Fahrenheit	˚F	(˚F - 32) x 0.56 =	Celsius	˚C
Velocity	feet per minute	ft/min	x 0.3048 =	meters per minute	m/min
	feet per second	ft/s	x 0.3048 =	meters per second	m/s
	miles per hour	mph	x 1.6063 =	kilometers per hour	km/h
Volume	US gallons	US gal.	x 3.7854 =	liters	L
	ounces	oz.	x 29.5735 =	milliliters	ml
	cubic inches	$in.^3$	x 16.3871 =	cubic centimeters	cm^3 or cc
Weight	pounds	lb	x 0.4536 =	kilograms	kg

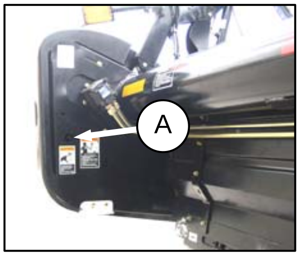
8.4 ENDSHIELDS

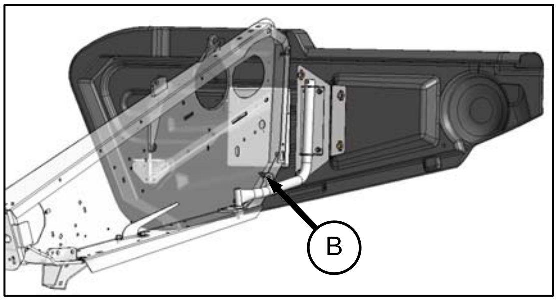
Single knife headers are fitted with a hinged endshield on the LH end of the header for easy access to the header drive. The RH end is not hinged, but is still removable.

Double knife headers are fitted with hinged endshields on both ends of the header.

8.4.1 HINGED

a. To open the hinged endshield, press against latch in opening at (A) on inboard side of endsheet.





b. Pull shield away from header, and swing it out and back behind the endsheet until the latch (B) engages the hook on the endsheet.



c. To close shield, lift latch (B), and swing the shield forward until the front engages the crop divider (C).



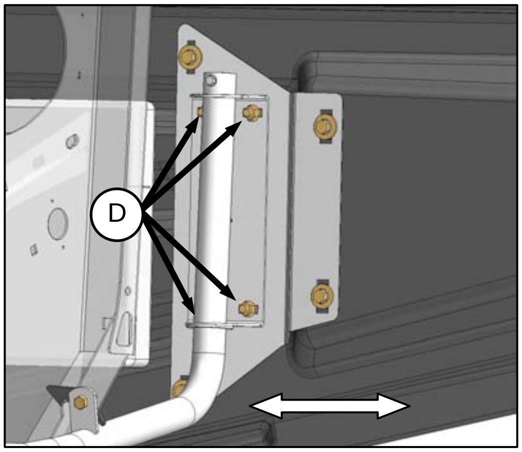
d. Push in shield where shown (opposite latch) and shield will self-latch.

8.4.1.1 Adjustments

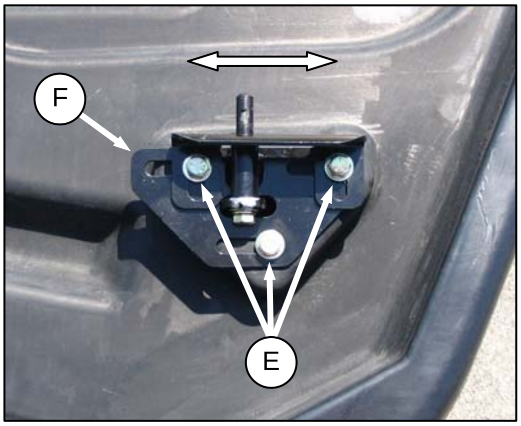
NOTE

Plastic endshields are subject to expansion or contraction depending on large temperature variations. Latch pin can be adjusted to compensate for dimensional changes.

a. Open endshield.

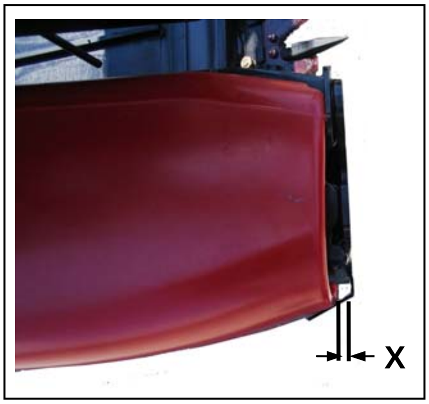


b. Loosen bolts (D) on support.



c. Loosen bolts (E) on latch assembly (F).

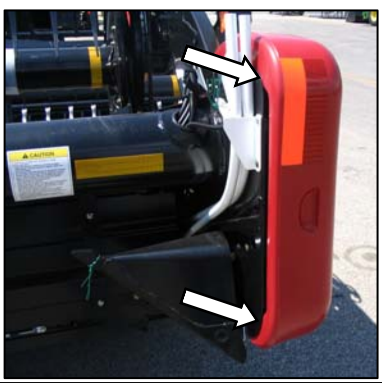
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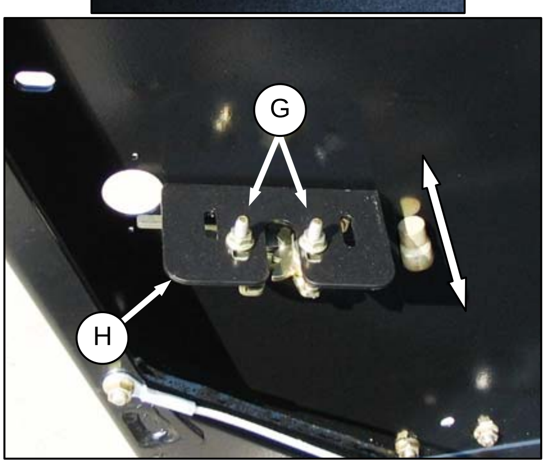


d. Adjust the endshield to achieve the gap **'X'** between the front end of the shield and the header frame, in accordance with this chart.

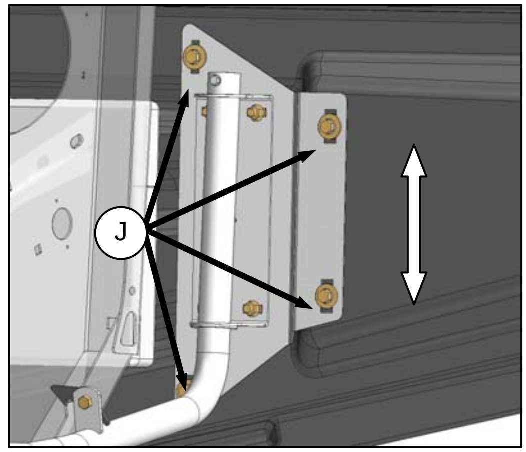
TEMPERATURE Degrees °F (°C)	GAP 'X' Inches (mm)
25 (- 4)	1.1 (28)
45 (7)	1.0 (24)
65 (18)	0.79 (20)
85 (29)	0.64 (16)
105 (41)	0.5 (12)
125 (52)	0.32 (8)
145 (63)	0.16 (4)
165 (89)	0

e. Tighten bolts (D) and (E) (shown on previous page).





f. To achieve a snug fit between the aft end of the shield and header frame, loosen bolts (G), and adjust the latch (H) to re-position the shield.



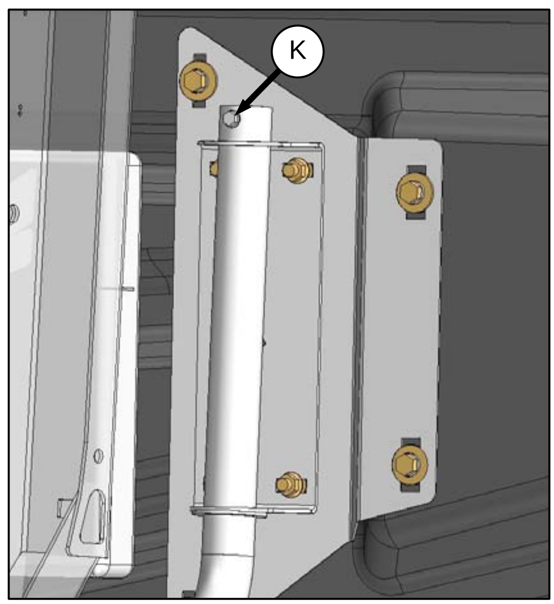
g. Loosen bolts (J) on endshield support, and adjust endshield to align with endsheet, as shown above.

h. Tighten bolts (G) and (J).

i. Close endshield.

8.4.1.2 Removal

a. Open endshield.

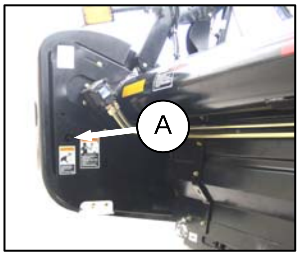


b. Remove screw (K) at top of support tube.

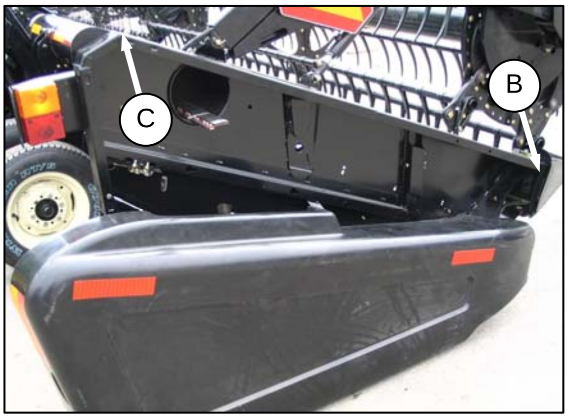
c. Lift endshield off support tube.

8.4.2 NON-HINGED

a. To remove the endshield, press against latch in opening at (A) on inboard side of endsheet.



b. Lift up on shield, pull out and back to remove shield.



c. To install shield, locate forward end in crop divider (B), and position shield over endsheet. Pin (C) at top of endsheet must engage shield.



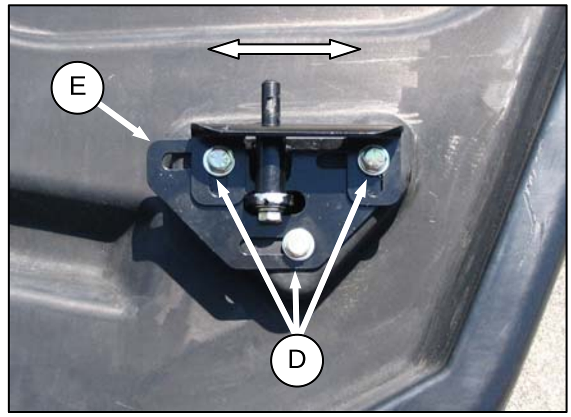
d. Push in shield where shown (opposite latch), and shield will self-latch.

8.4.2.1 Adjustments

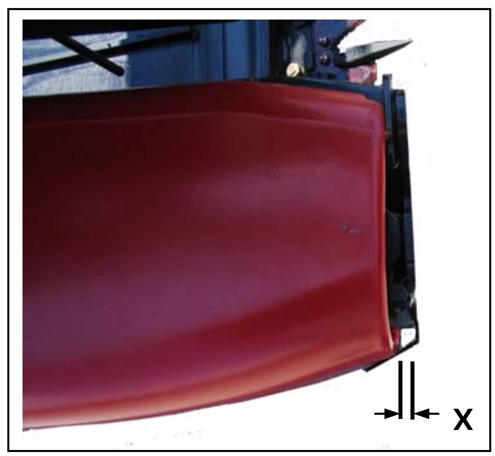
NOTE

Plastic endshields are subject to expansion or contraction depending on large temperature variations. Latch pin can be adjusted to compensate for dimensional changes.

a. Remove endshield.



b. Loosen bolts (D).



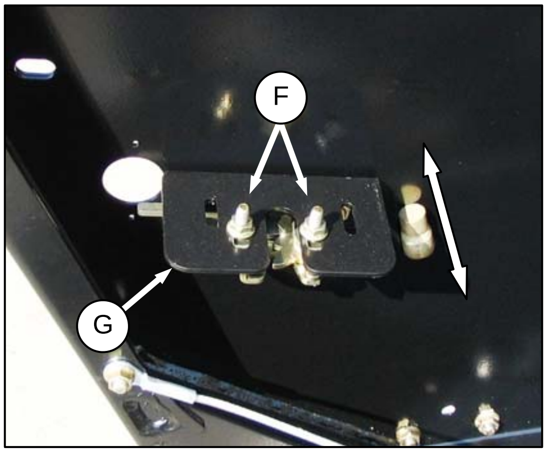
c. Adjust the pin assembly (E) to achieve the gap **'X'** between the front end of the shield and the header frame in accordance with the following chart.

TEMPERATURE Degrees ˚F (˚C)	**GAP 'X' Inches (mm)**
25 (- 4)	1.1 (28)
45 (7)	1.0 (24)
65 (18)	0.79 (20)
85 (29)	0.64 (16)
105 (41)	0.5 (12)
125 (52)	0.32 (8)
145 (63)	0.16 (4)
165 (89)	0

d. Tighten bolts (D).

(continued next page)





e. To achieve a snug fit between the aft end of the shield and header frame, loosen bolts (F), and adjust the latch (G) to re-position the shield.

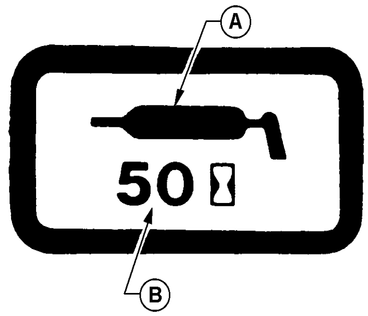
f. Tighten bolts (F).

8.5 LUBRICATION

CAUTION

To avoid personal injury, before servicing header or opening drive covers, follow procedures in Section 8.1 PREPARATION FOR SERVICING.

Refer to Section 8.3.4 Recommended Fluids and Lubricants for recommended greases.



SAMPLE GREASE DECAL

The greasing points are marked on the machine by decals showing a grease gun (A), and grease interval (B) in hours of operation.

Log hours of operation, and use the "Maintenance Checklist" provided to keep a record of scheduled maintenance.

Refer to Section 8.11 MAINTENANCE SCHEDULE.

8.5.1 GREASING PROCEDURE

a. Wipe grease fitting with a clean cloth before greasing, to avoid injecting dirt and grit.

b. Inject grease through fitting with grease gun until grease overflows fitting, except where noted.

c. Leave excess grease on fitting to keep out dirt.

d. Replace any loose or broken fittings immediately.

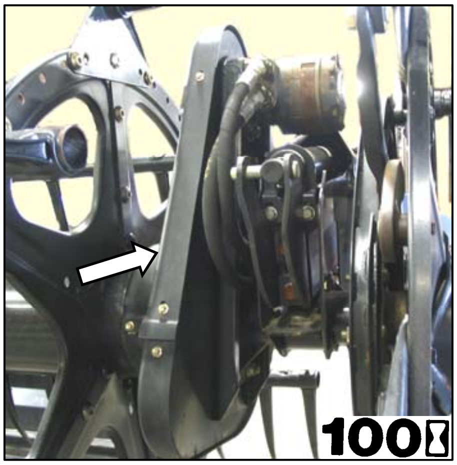
e. If fitting will not take grease, remove and clean thoroughly. Also clean lubricant passageway. Replace fitting if necessary.

8.5.2 LUBRICATION POINTS

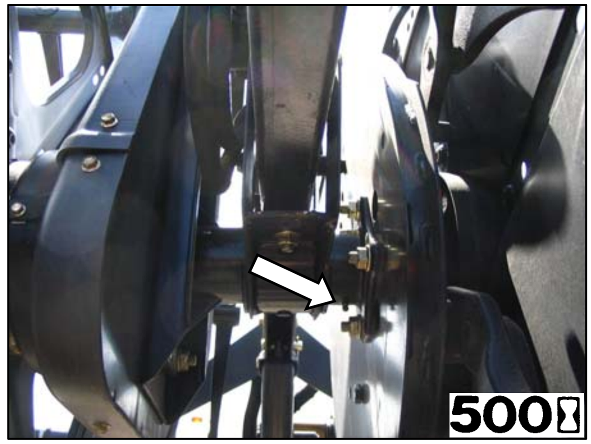
Refer to the illustrations on the following pages to identify the various locations that require lubrication.

8.5.2 LUBRICATION POINTS (Cont'd)

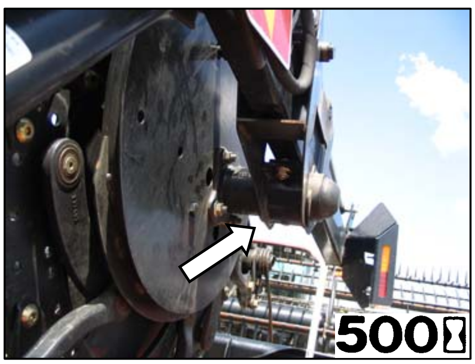
NOTE: REEL BEARING LUBE INTERVALS - 500 HOURS OR ONCE PER SEASON - WHICHEVER OCCURS FIRST.



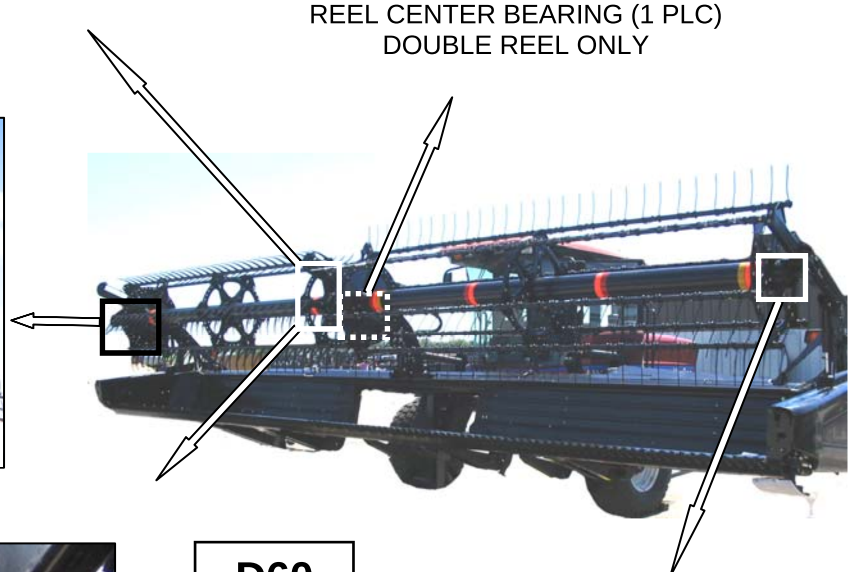
REEL DRIVE CHAIN (1 PLC)
DOUBLE REEL SHOWN -
SINGLE REEL SIMILAR



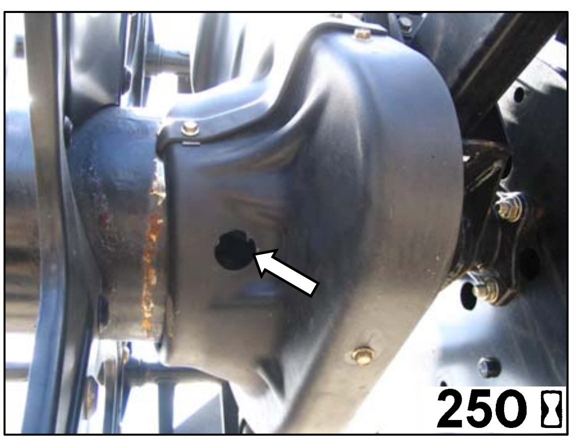
REEL CENTER BEARING (1 PLC)
DOUBLE REEL ONLY



REEL SHAFT RH BEARING (1 PLC)



D60



REEL UNIVERSAL (1 PLC)

NOTE

U-JOINT HAS AN EXTENDED LUBRICATION CROSS AND BEARING KIT. STOP GREASING WHEN GREASING BECOMES DIFFICULT OR IF U-JOINT STOPS TAKING GREASE. ***OVER-GREASING WILL DAMAGE U-JOINT****. 6 - 8 PUMPS ARE SUFFICIENT AT FIRST GREASE (FACTORY). DECREASE GREASE INTERVAL AS U-JOINT WEARS AND REQUIRES MORE THAN 6 PUMPS.*



REEL SHAFT LH BEARING (1 PLC)

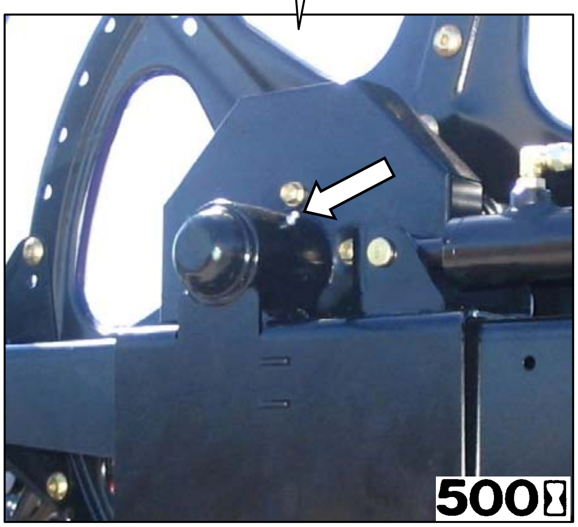
8.5.2 LUBRICATION POINTS (Cont'd)

D50

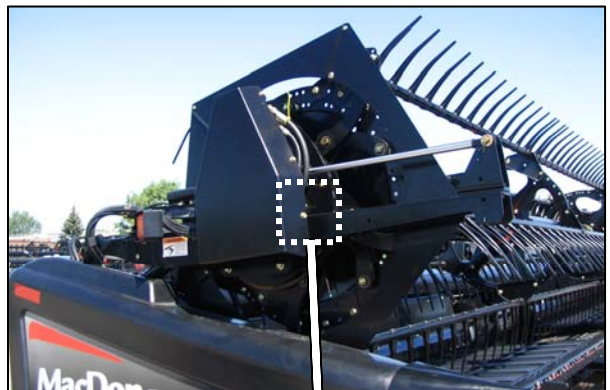
High Temperature Extreme Pressure (EP2) Performance With 1% Max Molybdenum Disulphide (NLGI Grade 2). Lithium Base

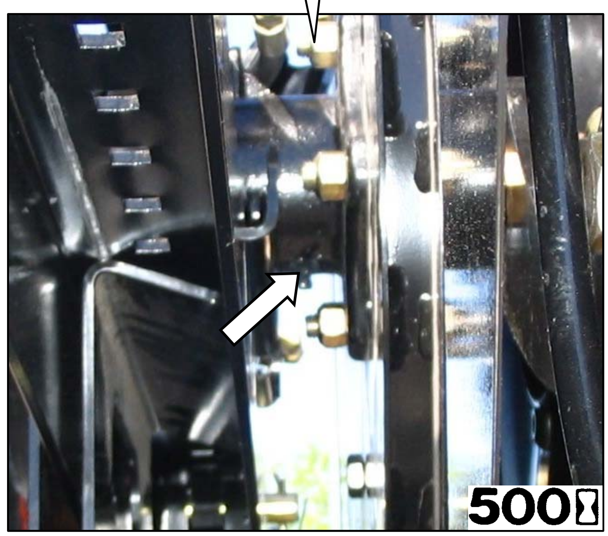






REEL SHAFT LH BEARING (1 PLC)





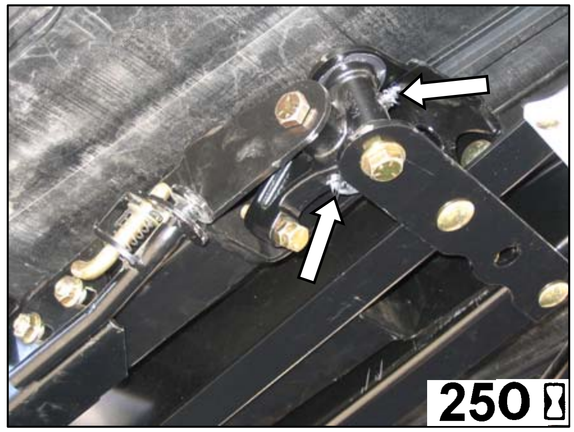
REEL SHAFT RH BEARING (1 PLC)

8.5.2 LUBRICATION POINTS (Cont'd)

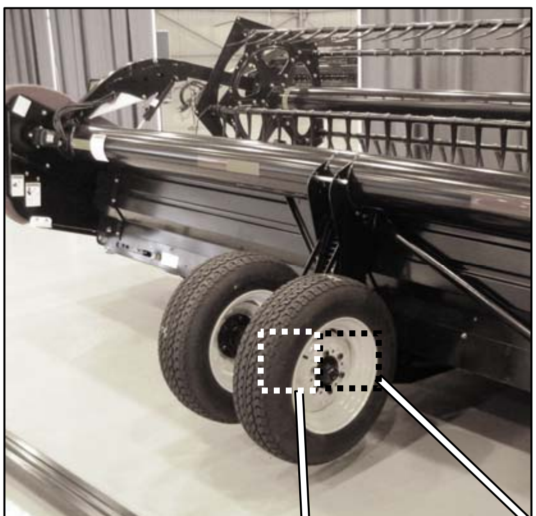
NOTE: LUBE INTERVALS - 250 HOURS OR ONCE PER SEASON - WHICHEVER OCCURS FIRST.

High Temperature Extreme Pressure (EP2) Performance With 1% Max Molybdenum Disulphide (NLGI Grade 2). Lithium Base





RIGHT SIDE - WHEEL AXLE (2 PLCS)


LEFT SIDE WHEELS


RIGHT SIDE WHEELS

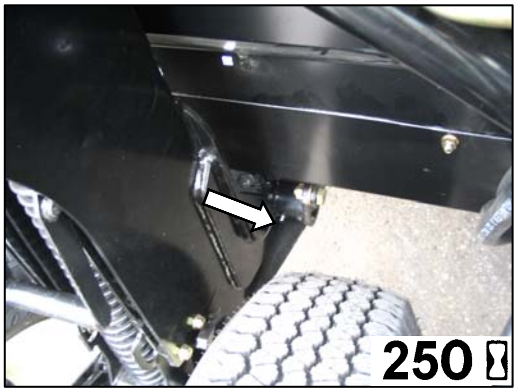


LEFT SIDE - WHEEL PIVOT (1 PLC)



WHEEL BEARINGS (2 PLCS BOTH SIDES)

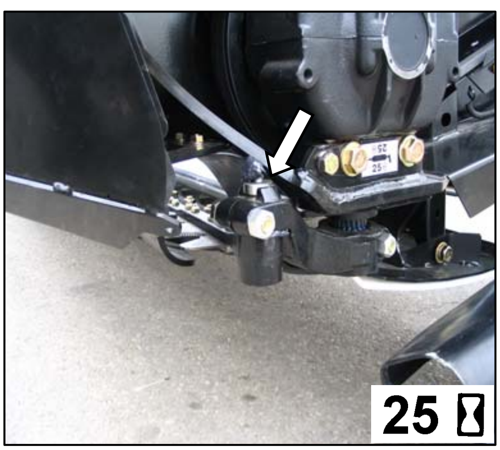
8.5.2 LUBRICATION POINTS (Cont'd)



FRAME/WHEEL PIVOT (1 PLC) BOTH SIDES

High Temperature Extreme Pressure (EP2) Performance With 1% Max Molybdenum Disulphide (NLGI Grade 2). Lithium Base





SICKLE HEAD
1 PLC - SINGLE KNIFE
2 PLCS - DOUBLE KNIFE

NOTE

To prevent binding and/or excessive wear caused by sickle pressing on guards, do not over- grease. If more than 6 to 8 pumps of the grease gun are required to fill the cavity, replace the seal in the sickle head.

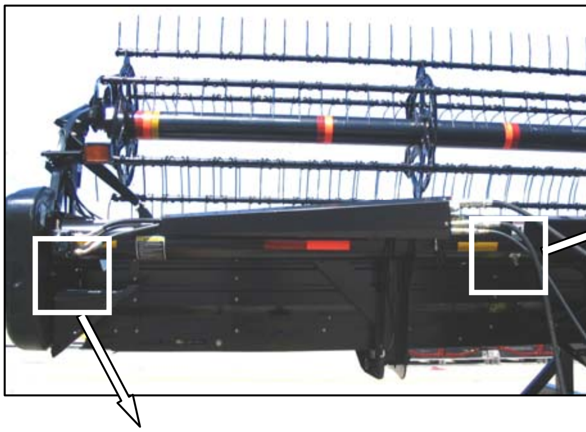
NOTE

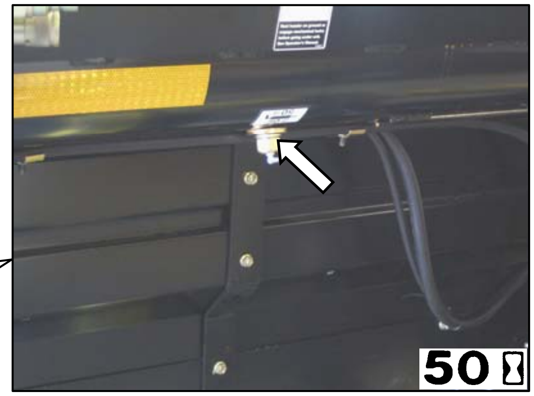
Check for signs of excessive heating on first few guards after greasing. If required, relieve pressure by depressing check-ball in grease fitting.

8.5.2 LUBRICATION POINTS (Cont'd)

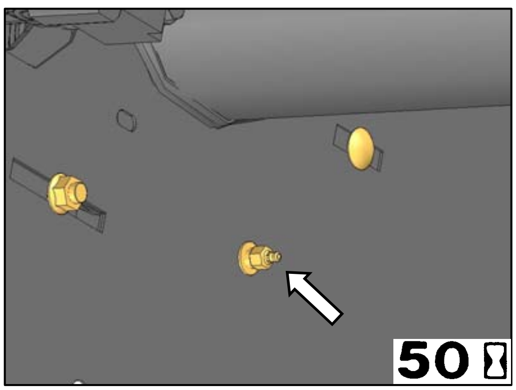
High Temperature Extreme Pressure (EP2) Performance With 1% Max Molybdenum Disulphide (NLGI Grade 2). Lithium Base



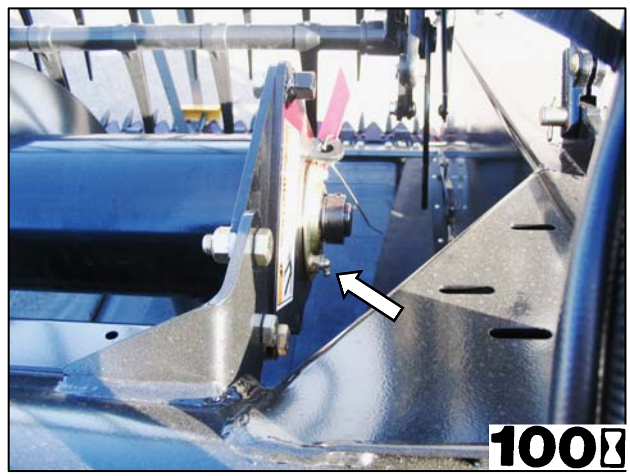




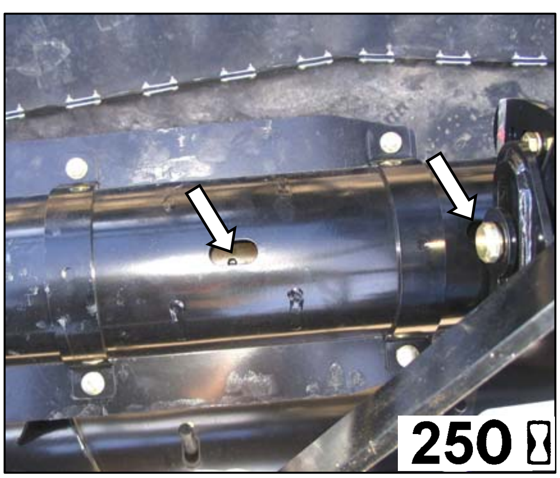
KNIFE DRIVE SHAFT - DK (BOTH SIDES)
15 PUMPS MINIMUM



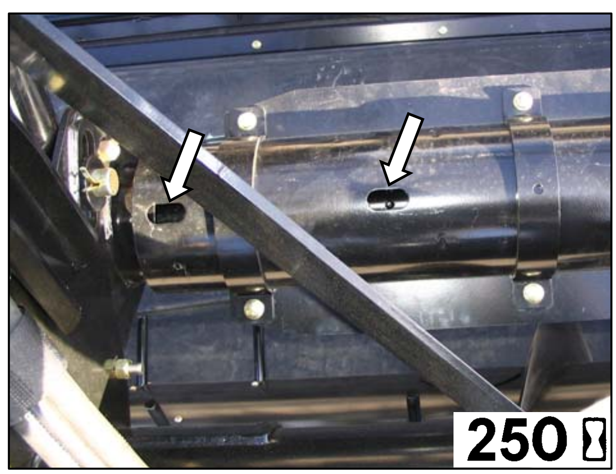
KNIFE DRIVE BEARING - DK (BOTH SIDES)



UPPER CROSS AUGER - 1 PLC



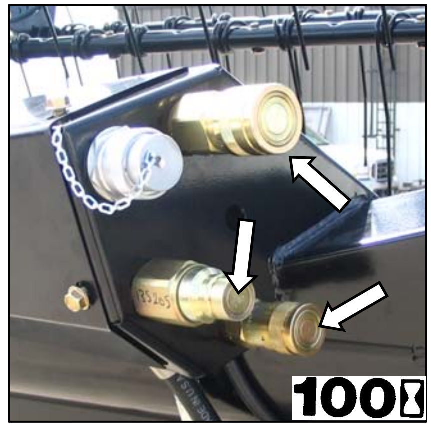
UPPER CROSS AUGER - 2 PLCS



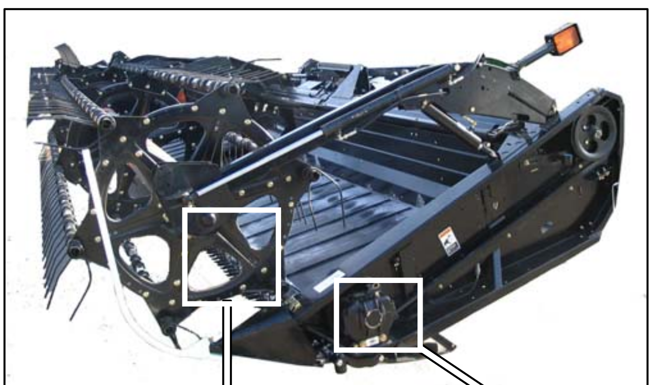
UPPER CROSS AUGER - 2 PLCS

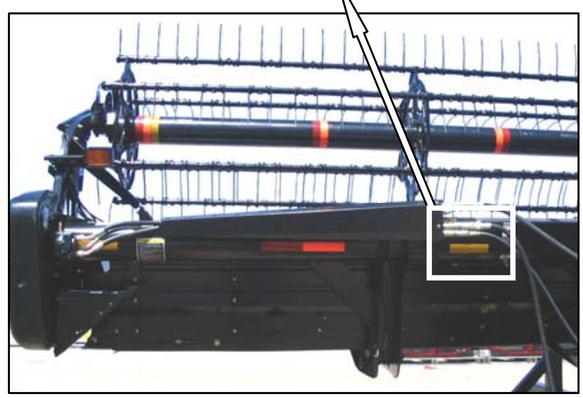
8.5.3 OILING REQUIREMENTS

Refer to the following illustration to identify the various locations that require lubrication. See Section 8.3.4 Recommended Fluids and Lubricants for proper oil.



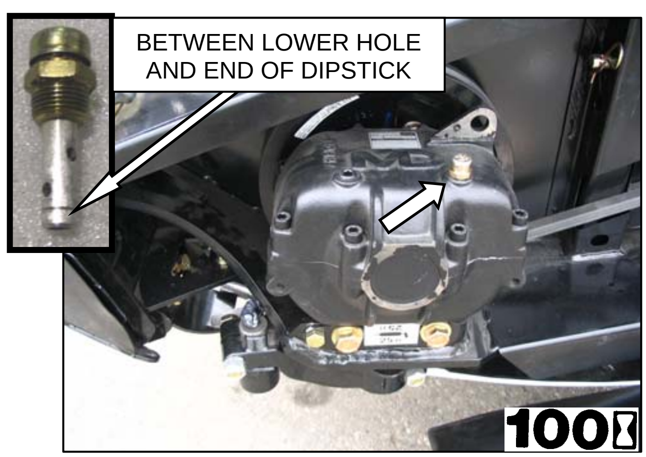
LUBRICATE WITH WD40® (OR EQUIVALENT)







OIL SICKLE DAILY EXCEPT IN SANDY SOIL



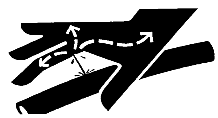
WOBBLE BOX (CHECK OIL LEVEL WITH TOP OF WOBBLE BOX HORIZONTAL)

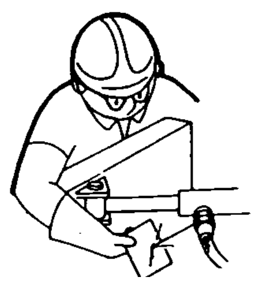
8.5.4 HOSES AND LINES

Check hydraulic hoses and lines daily for signs of leaks.

WARNING

- **Avoid high-pressure fluids. Escaping fluid can penetrate the skin causing serious injury. Relieve pressure before disconnecting hydraulic lines. Tighten all connections before applying pressure. Keep hands and body away from pin-holes and nozzles which eject fluids under high pressure.**
- **If ANY fluid is injected into the skin, it must be surgically removed within a few hours by a Doctor familiar with this type of injury or gangrene may result.**
- **Use a piece of cardboard or paper to search for leaks.**





IMPORTANT

Keep hydraulic coupler tips and connectors clean. Dust, dirt, water and foreign material are the major causes of hydraulic system damage.

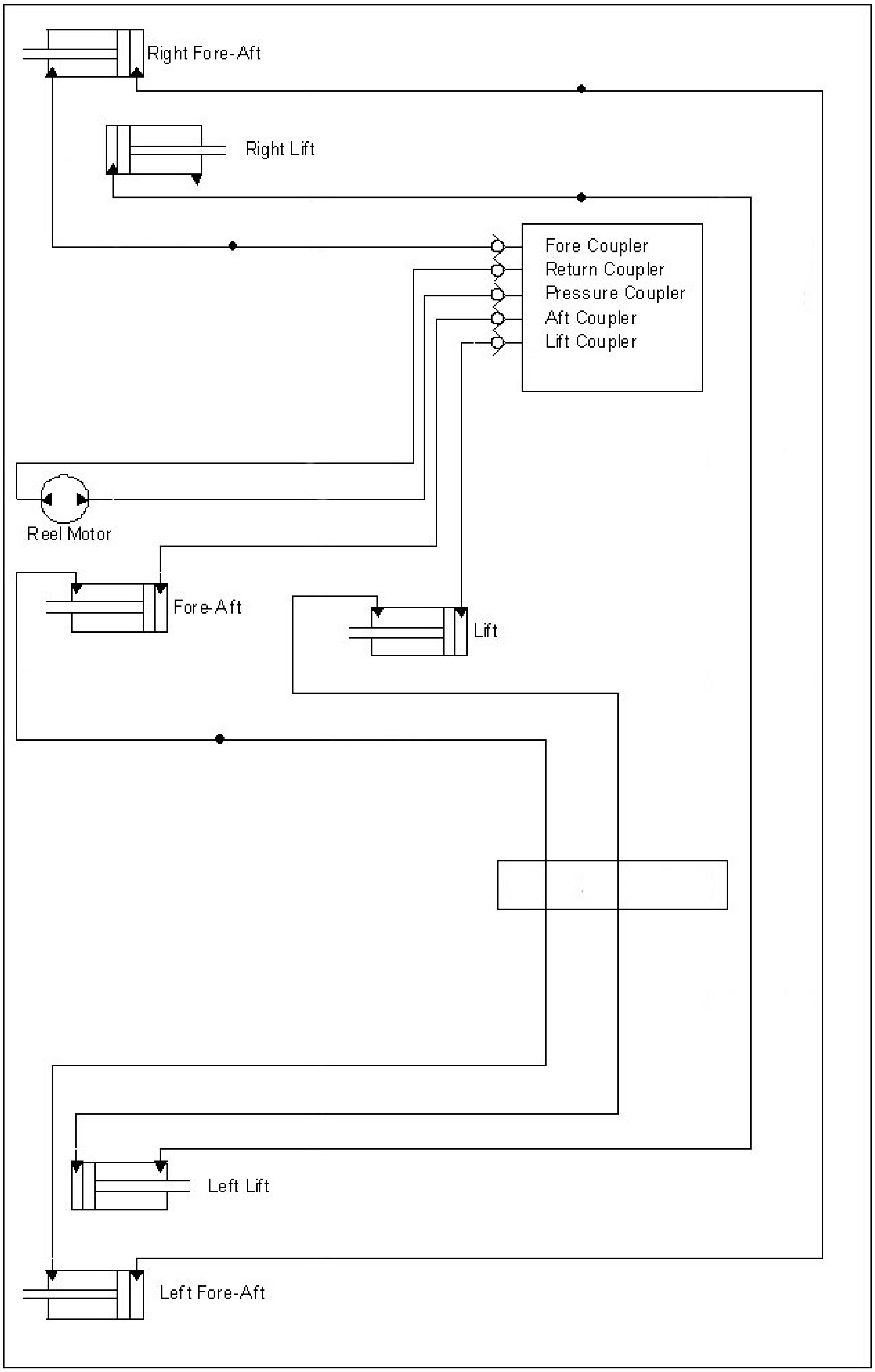
DO NOT attempt to service hydraulic system in the field. Precision fits require WHITE ROOM CARE during overhaul.

8.5.5 HYDRAULIC SCHEMATICS

Refer to the appropriate schematic that suits your machine.

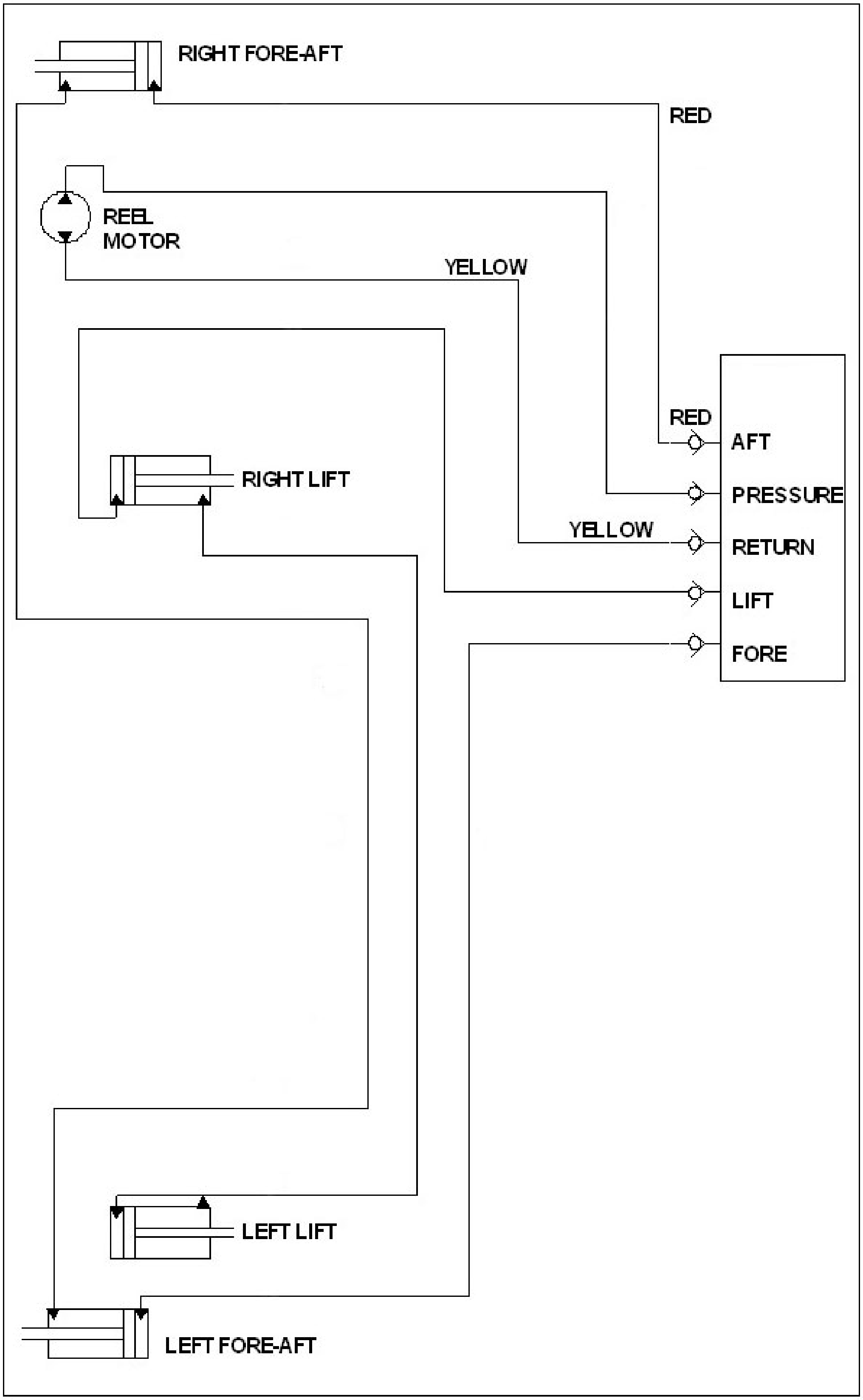
8.5.5.1 Double Reel

D60 Harvest Header



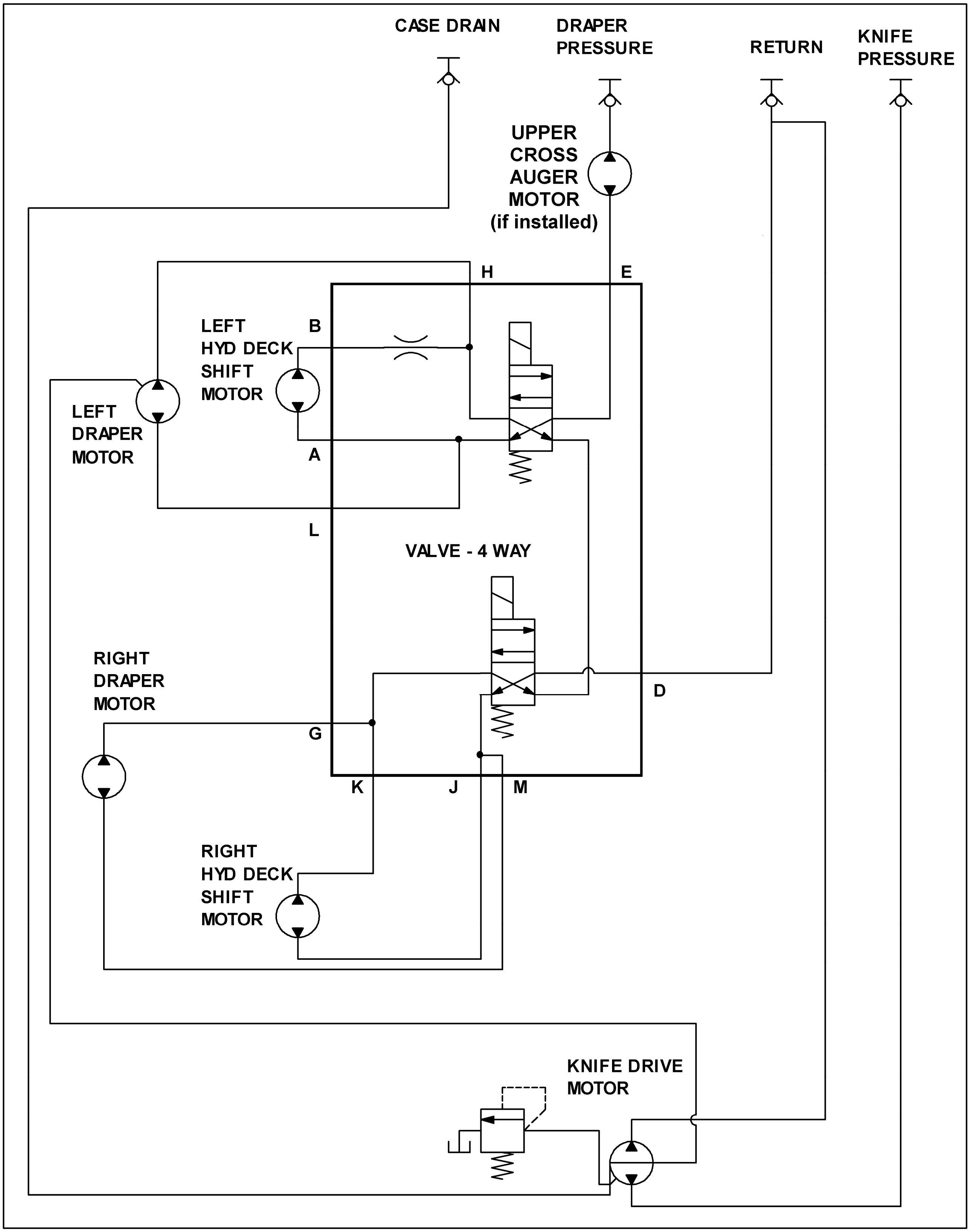
8.5.5.2 Single Reel

D50 and D60 Harvest Header



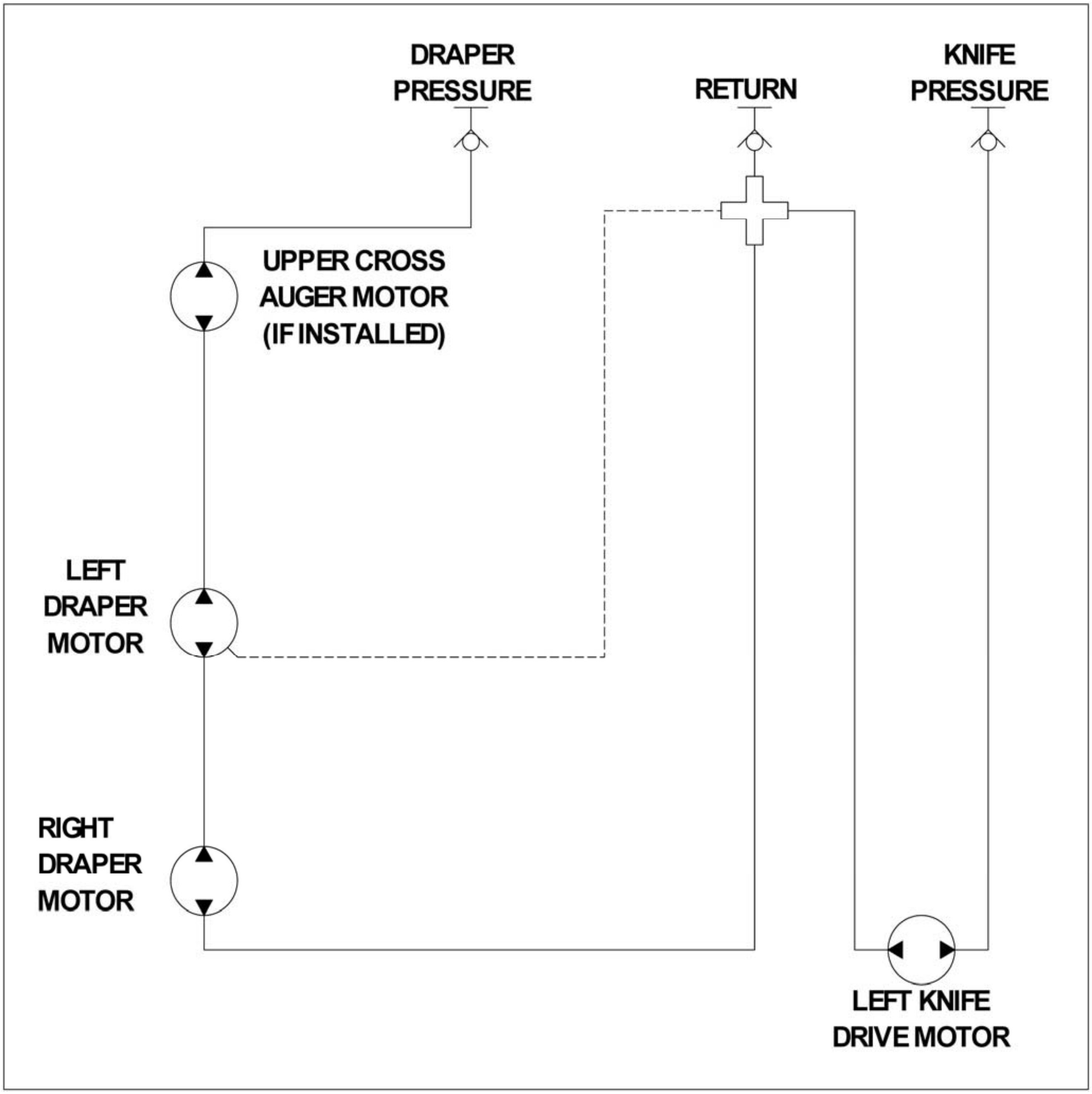
8.5.5.3 Double Knife - Hydraulic Deck Shift

D60 Harvest Header



8.5.5.4 Single Knife - Manual Deck Shift

D50 Harvest Header



8.6 ELECTRICAL

a. Use electrical tape and wire clips as required to prevent wires from dragging or rubbing.

b. Keep lights clean, and replace defective bulbs.

c. To replace light bulbs:



1. Using a Phillips screwdriver, remove screws from fixture, and remove plastic lens.
2. Replace bulb, and re-install plastic lens and screws.

NOTE

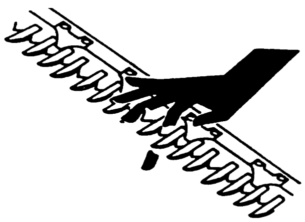
Bulb Part Number - Trade #1156.

8.7 SICKLE AND SICKLE DRIVE

CAUTION

To avoid personal injury, before servicing machine or opening drive covers, follow procedures in Section 8.1 PREPARATION FOR SERVICING.

WARNING



Keep hands clear of the area between guards and sickle at all times.

CAUTION

Wear heavy gloves when working around or handling sickles.

8.7.1 SICKLE SECTIONS

Check daily that sections are firmly bolted to the sickle back, and are not worn or broken. Damaged or worn sections leave behind uncut plants.

Coarse serrated sections last longer than fine serrated sections in dirty or sandy conditions.

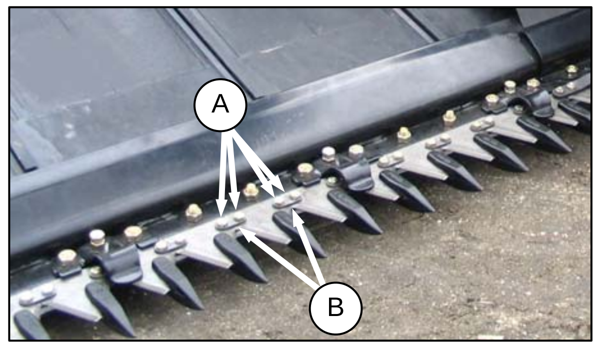
Fine serrated sections perform better in fine stemmed grasses and plants that contain more fibrous stems.

A worn or broken sickle section can be replaced without removing sickle from cutterbar.

Replace sickle section as follows:

NOTE

Stroke sickle as required to expose sickle.



a. Remove locknuts (A).
b. Remove bars (B), and lift sickle section off knife.

IMPORTANT

Do not mix heavy and light sickle sections on same sickle.

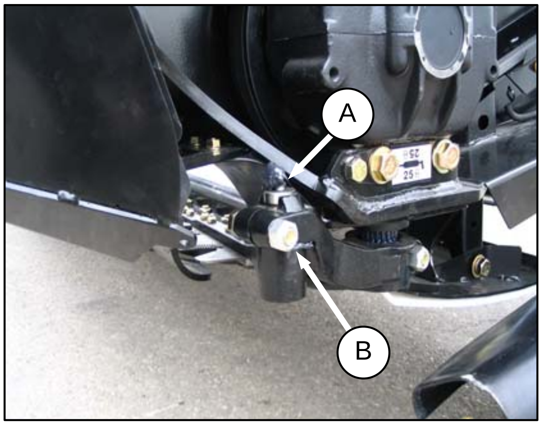
c. Clean any dirt off of sickle back, and position new sickle section on knife.
d. Re-position bars (B), and install locknuts (A).
e. Torque nuts to 7 ft·lbf (9.5 N·m).

8.7.2 SICKLE REMOVAL

WARNING

Stand to rear of sickle during removal to reduce risk of injury from cutting edges. Wear heavy gloves when handling sickle.

a. Stroke sickle to its outer limit, and clean area around sickle head.



b. Remove zerk from pin (A).
c. Remove nut and bolt (B).
d. Insert screwdriver in groove of pin (A), and pry up on sickle head pin to free sickle. Pin does not have to be removed from arm.
e. Seal bearing in sickle head with plastic or tape.
f. Wrap a chain around sickle head, and pull sickle out.

NOTE

For single drive sickles with splice plate, remove bolts from splice plate and pull sickle out from both ends.

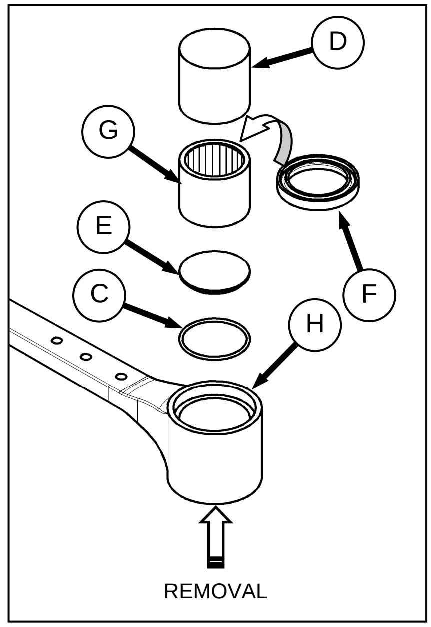
8.7.3 SICKLE HEAD BEARING REPLACEMENT

8.7.3.1 Bearing Removal

a. Remove sickle. Refer to previous section.
b. Using a flat-ended tool (D) with approximately the same diameter as the plug (E), tap out the seal (F), bearing (G), and plug from the underside of the head (shown at top of next column).

NOTE

The seal can be replaced without removing the bearing. When changing seal, check pin and needle bearing for wear. Replace if necessary.

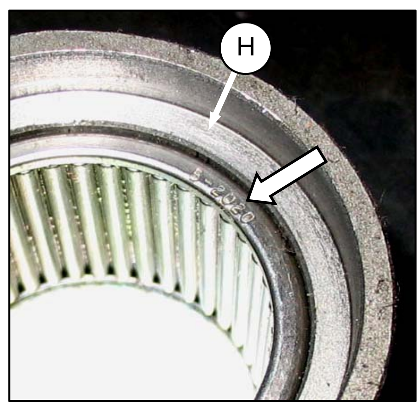


8.7.3.2 Bearing Installation

a. Place O-ring (C) and plug (E) in sickle head.

IMPORTANT

Install the bearing with the stamped end (the end with identification markings) against the tool.



b. Using a flat-ended tool (D) with approximately the same diameter as the bearing (G), push the bearing into the sickle head until the top of the bearing is flush with the step (H) in sickle head.
c. Install seal (F) in top of sickle head with lip facing outwards.

IMPORTANT

To avoid premature sickle head or wobble box failure, be sure there is <u>no</u> looseness in:

- Fit of sickle head pin and needle bearing, and
- Fit of sickle head pin and pitman arm.

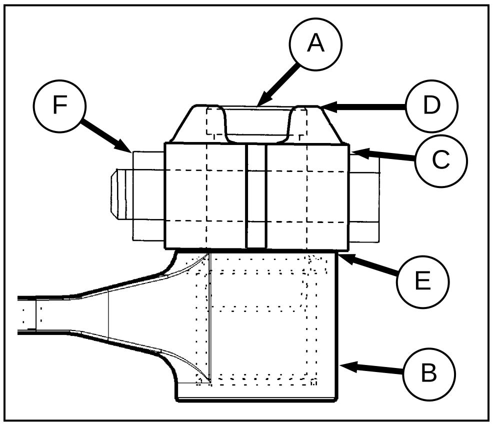
8.7.4 SICKLE INSTALLATION

WARNING

Stand to rear of sickle during installation to reduce risk of injury from cutting edges. Wear heavy gloves when handling sickle.

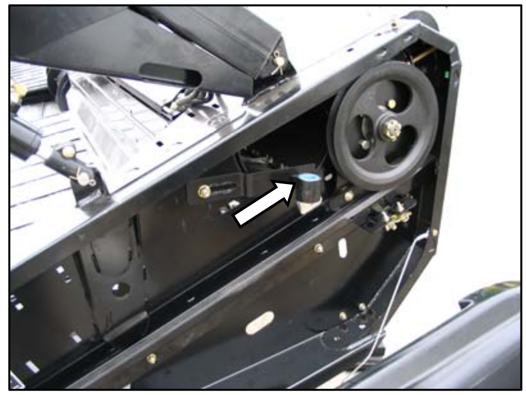
IMPORTANT

Align guards, and re-set sickle hold-downs while replacing sickle.



a. If sickle head pin (A) is installed in the sickle head, remove the pin.
b. Slide sickle into place, and align sickle head (B) with pitman arm (C).
c. Install sickle head pin (A) in pitman arm ,and tap it down into the sickle head, ensuring pin is “bottomed out” in the sickle head.
d. Tap the underside of the sickle head (B) until the pin is flush with the upper face (D) of the pitman arm and until it “just” contacts pitman arm (0.010 in. (0.25 mm)) gap (E).
e. Re-install bolt and nut (F).
f. Tighten nut to 160 ft·lbf (220 N·m).
g. Re-install grease zerk in pin.
h. Grease bearing.

8.7.5 SPARE SICKLE (SINGLE KNIFE HEADERS)



A spare sickle may be stored in the header frame tube at the left end as shown above.

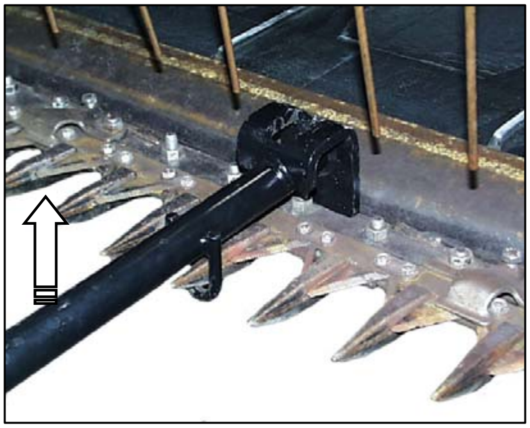
Ensure sickle is secured in place.

8.7.6 SICKLE GUARDS

Check **daily** that guards are aligned to obtain proper shear cut between sickle section and guard. Sickle sections should contact shear surface of each guard.

8.7.6.1 Guard Adjustment

To align guards, proceed as follows: The guard straightening tool (MacDon part #140135) is available from your MacDon Dealer:



UPWARD ADJUSTMENT

a. To adjust guard tips upwards, position tool as shown and pull “up”.



DOWNWARD ADJUSTMENT

b. To adjust tips downward, position tool as shown and push “down”.

TIP: If trouble is encountered cutting tangled, or fine-stemmed material, replace lower guards with stub guards, and install a sickle hold-down on every guard.

If material is tough to cut, install stub guards with top guard and adjuster plate. A stub guard conversion kit is available from your MacDon Dealer. Refer to Section 10.3 STUB GUARD CONVERSION KIT.

8.7.6.2 Guard Replacement



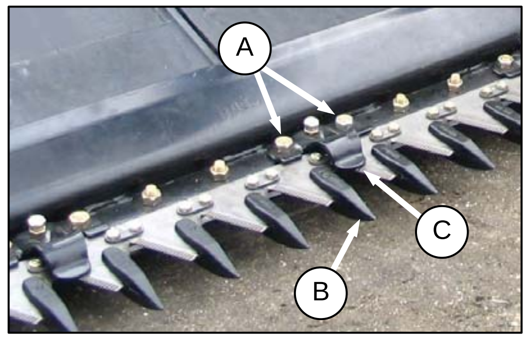
CAUTION

Always engage reel props before working under reel.

8.7.6.2.1 Pointed Guards - Single Knife

To replace pointed guards in single knife D50 and D60 Harvest Headers, proceed as follows:

a. Stroke the sickle so that the sickle sections are spaced midway between the guards.



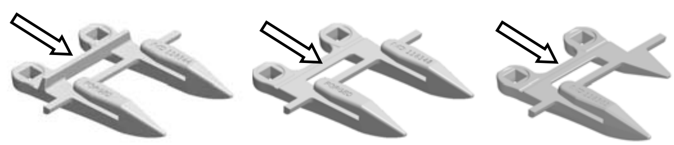
b. Remove the two nuts (A) and bolts that attach guard (B) and hold-down (C) (if applicable) to the cutterbar.

c. Remove the guard, hold-down, and poly wear plate (if installed).

d. Position new guard and poly wear plate (if applicable) on cutterbar, and install carriage bolts.

IMPORTANT

The first four outboard guards on drive side(s) of the header do not have a ledger plate. Ensure that the proper replacement is installed.



e. Install hold-down, and secure with nuts. Tighten nuts to 50 ft·lbf (68 N·m).

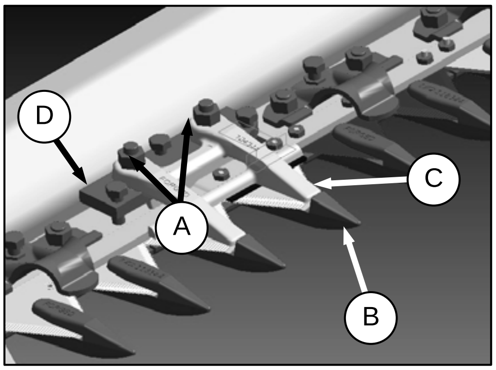
f. Check and adjust clearance between hold-down and sickle. Refer to Section 8.7.7 Sickle Hold-Downs.

8.7.6.2.2 Pointed Guards - Double Knife

Refer to previous section for typical guard replacement.

The guard near the center of the double knife header, where the two sickles overlap, requires a slightly different replacement procedure.

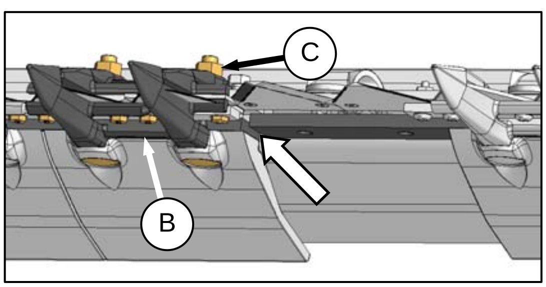
Replace the center guard or center top guide as follows:

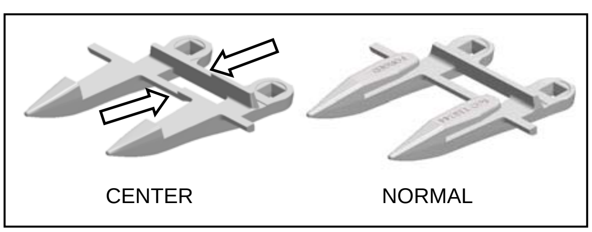


a. Remove the two nuts (A) and bolts that attach guard (B) and top guide (C) to cutterbar.
b. Remove guard, poly wear plate (if installed), top guide (C), and adjuster bar (D).
c. Position poly wear plate (if applicable), replacement guard (B), adjuster bar (D), top guide (C), and install bolts, but do **not** tighten.

IMPORTANT

Ensure center guard (B) (right of cutterbar split) has offset cutting surfaces. See illustrations.





NOTE

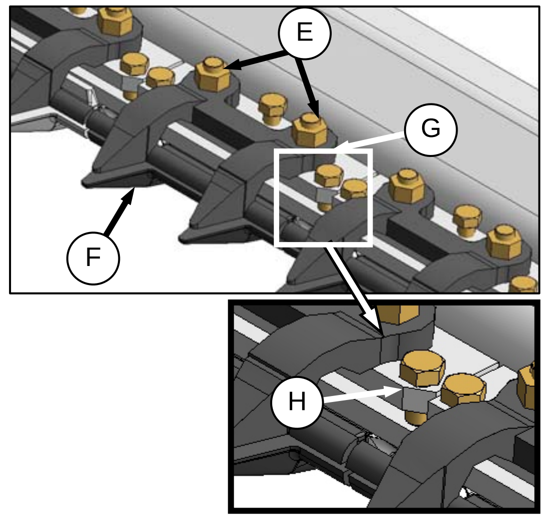
Top guide (C) must accommodate the two overlapping knives at center guard location on double-knife header. Ensure replacement is correct part.

d. Check and adjust clearance between hold-down and sickle. Refer to Section 8.7.7 Sickle Hold-Downs.

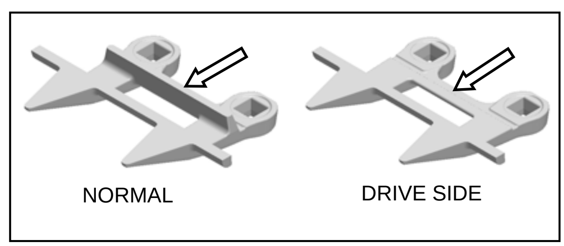
8.7.6.2.3 Stub Guards - Single Knife

Stub guards, complete with top guides and adjuster plates are designed to cut tough crops. Only the D60 Harvest Header 15, 20, and 25 FT. models can be equipped with stub guards.

Replace stub guards as follows:



a. Remove the two nuts (E) and bolts that attach guard (F) and top guide (G) to cutterbar.
b. Remove guard, poly wear plate (if installed), top guide, and adjuster bar (H).
c. Position poly wear plate (if applicable), replacement guard (F), adjuster bar (H), top guide (G), and install bolts. Do not tighten.



IMPORTANT

Note position of mitre on adjuster bar (H). Bar should be re-installed in same position. Mitres should not be adjacent to each other.

IMPORTANT

The first four outboard guards on drive side(s) of the header do not have a ledger plate. Ensure that the proper replacement is installed.

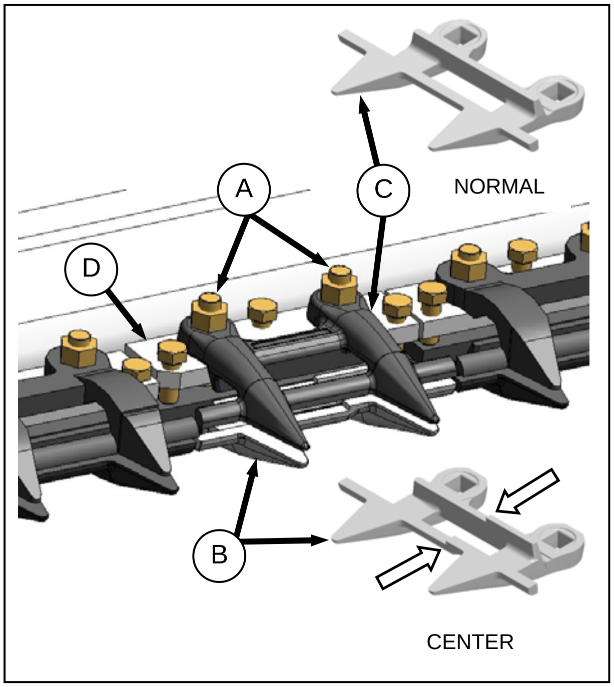
d. Check and adjust clearance between top guide and sickle. Refer to Section 8.7.7 Sickle Hold-Downs.

8.7.6.2.4 Stub Guards – Double Knife

Refer to previous section for typical guard replacement.

The guard at the center of the double knife header, where the two sickles overlap, requires a slightly different replacement procedure.

To replace the center guard or center top guide, proceed as follows:



a. Remove the two nuts (A) and bolts that attach guard (B) and top guide (C) and adjuster bar (D) to cutterbar.

b. Remove guard, poly wear plate (if installed), top guide (C), and adjuster bar (D).

c. Position poly wear plate (if applicable), replacement guard (B), adjuster bar (D), top guide (C), and install bolts but do **not** tighten.

IMPORTANT

Ensure center guard (B) (right of cutterbar split) has offset cutting surfaces. See illustration.

NOTE

Top guide (C), which is an inverted normal stub guard, must accommodate the two overlapping knifes at center guard location on double-knife header. Ensure replacement is correct part.

d. Check and adjust clearance between hold-down and sickle. Refer to Section 8.7.7 Sickle Hold-Downs.

8.7.7 SICKLE HOLD-DOWNS

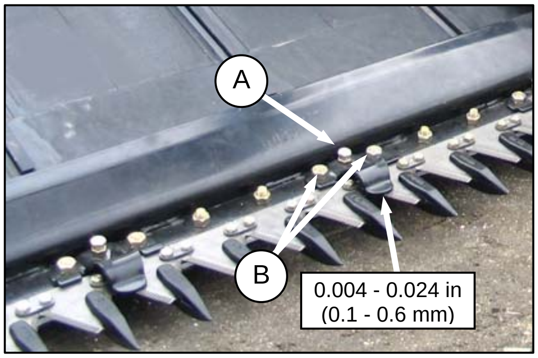
Check daily that sickle hold-downs are set to prevent sickle sections from lifting off guards, but still permit sickle to slide without binding.

NOTE

Guards should be aligned prior to adjusting hold-downs.

8.7.7.1 Pointed Guards

a. To adjust the clearance between the hold-down and sickle for typical pointed guards, proceed as follows:

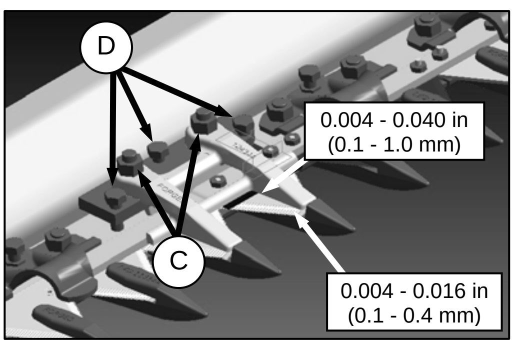


1. Using a feeler gauge, clearance from hold-down to sickle section should be 0.004 - 0.024 in. (0.1 - 0.6 mm).
2. Turn adjuster bolts (A) as required.

NOTE

For larger adjustments, it may be necessary to loosen nuts (B), turn adjuster bolt (A), then re-tighten nuts (B).

b. For center guard, proceed as follows:

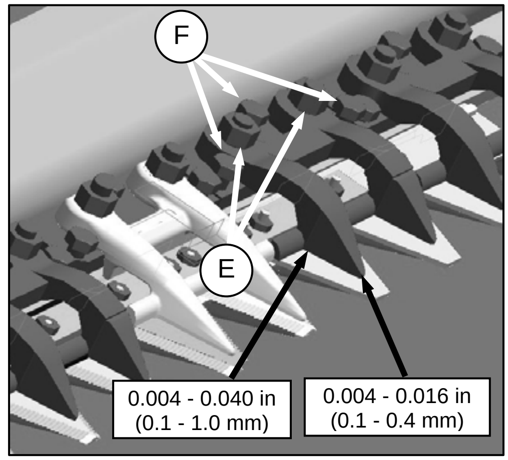


1. Torque nuts (C) to 35 ft·lbf (46 N·m).
2. Using a feeler gauge, clearance from hold-down to sickle section should be 0.004 - 0.016 in. (0.1 - 0.4 mm) at the guide tip, and 0.004 - 0.040 in. (0.1 - 1.0 mm) at rear of guide.
3. Turn adjuster bolts (D) as required.
4. Torque nuts (C) to 53 ft·lbf (72 N·m).

c. After adjusting all hold-downs, run header at a low engine speed, and listen for noise due to insufficient clearance. Insufficient clearance will also result in overheating of the sickle and guards. Re-adjust as necessary.

8.7.7.2 Stub Guards

a. To adjust the clearance between the hold-down and sickle for all stub guards, proceed as follows:



1. Torque nuts (E) to 35 ft·lbf (46 N·m).
2. Using a feeler gauge, clearance from hold-down to sickle section should be 0.004 - 0.016 in. (0.1 - 0.4 mm) at the guide tip, and 0.004 - 0.040 in. (0.1 - 1.0 mm) at rear of guide.
3. Turn adjuster bolts (F) as required.
4. Torque nuts (E) to 53 ft·lbf (72 N·m).

8.7.8 SICKLE DRIVE BELTS - NON-TIMED DRIVE

This section applies to single knife headers, and 40 FT. double knife headers with non-timed drives.

For double knife headers with timed drives, refer to Section 8.7.9 Sickle Drive Belts - Timed Drive.

8.7.8.1 Tension Adjustment

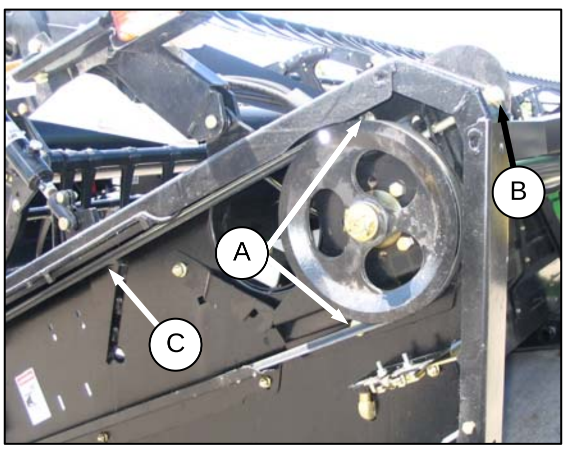
IMPORTANT

To prolong belt and drive life, do not over-tighten belt.

CAUTION

To avoid personal injury, before servicing machine or opening drive covers, follow procedures in Section 8.1 PREPARATION FOR SERVICING.

a. Open/remove endshield.



LH SHOWN - RH OPPOSITE

b. Loosen two bolts (A) on sickle drive mounting bracket.

c. Turn adjuster bolt (B) to move drive motor until a force of 20 lbf (80 N) deflects belt (C) 3/4 in. (18 mm) at mid-span.

d. Tighten jam-nut at (B), and bolts (A) on drive mounting bracket.

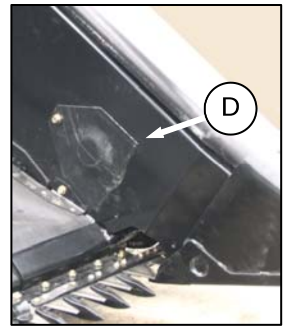
e. Re-adjust tension of a new belt, after a short run-in period, (about 5 hours).

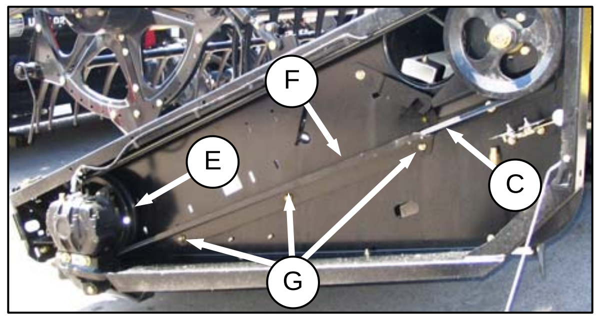
8.7.8.2 Removal

a. Loosen sickle drive belt using procedure in previous section so that belt (C) can be slipped off drive pulley.

b. Remove bolt in plate (D) in endsheet at wobble box, and remove the plate.

   This provides clearance between the pulley and endsheet for the belt when it is removed.





LH SHOWN - RH OPPOSITE

c. Slip belt over and behind wobble box pulley (E), and remove belt. Utilize the notch in the pulley to assist in removing the belt.

8.7.8.3 Installation

a. Route sickle drive belt (C) around wobble box pulley (E) and sickle drive pulley. Utilize the notch in the pulley to assist in installing the belt.

NOTE

When installing new belt, never pry belt over pulley. Be sure drive motor is fully forward, then tension belt.

b. Tighten belt. Refer to Section 8.7.8.1 Tension Adjustment.

c. Check clearance between belt (C) and belt guide (F). The measurement should be 0.04 in. (1 mm). Adjust as follows:

   1. Ensure belt is properly tensioned.
   2. Loosen bolts (G), and adjust position of guide as required.
   3. Tighten bolts.

d. Re-install plate (D) and secure with bolt and nut.

e. Re-install endshield.

8.7.9 SICKLE DRIVE BELTS - TIMED DRIVE

This section applies to 35 FT. and smaller double knife Model D60 Harvest Headers with timed drives.

For single knife headers and non-timed double knife headers, refer to Section 8.7.8 Sickle Drive Belts - Non-Timed Drive.

8.7.9.1 Left End Drive

Remove endshield at left end of header. Refer to Section 8.4 ENDSHIELDS.

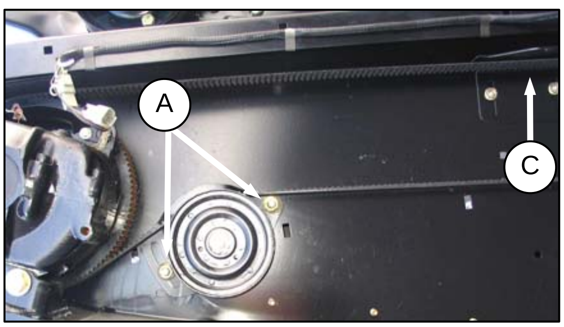
CAUTION

To avoid personal injury, before servicing machine or opening drive covers, follow procedures in Section 8.1 PREPARATION FOR SERVICING.

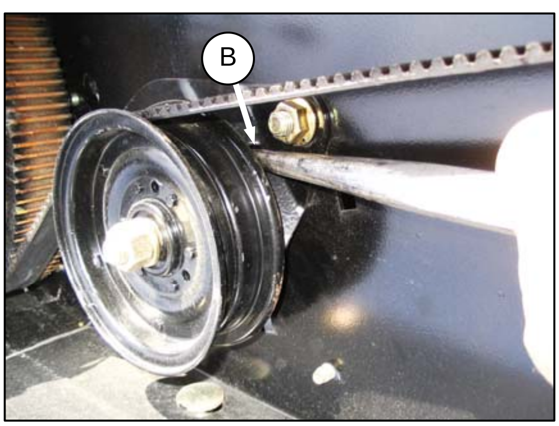
8.7.9.1.1 Tension Adjustment - Timing Belt

IMPORTANT

To prolong belt and drive life, do not over-tighten belt.

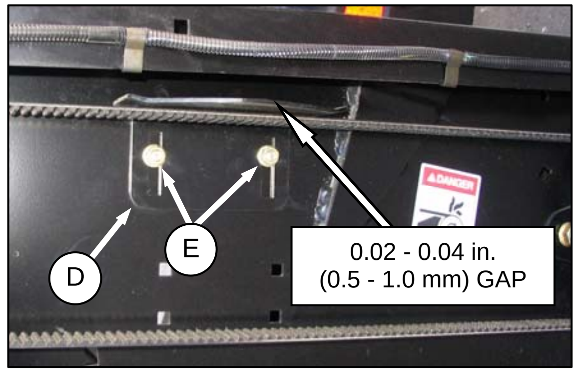


a. Loosen two nuts (A) on sickle drive belt idler bracket.



b. Insert a long punch (or equivalent) into hole (B) in idler bracket, and pry “downward” until a force of 6 lbf (27 N) deflects timing belt 1/2 in. (13 mm) at mid-span (C).

c. Tighten nuts (A) on idler mounting bracket.

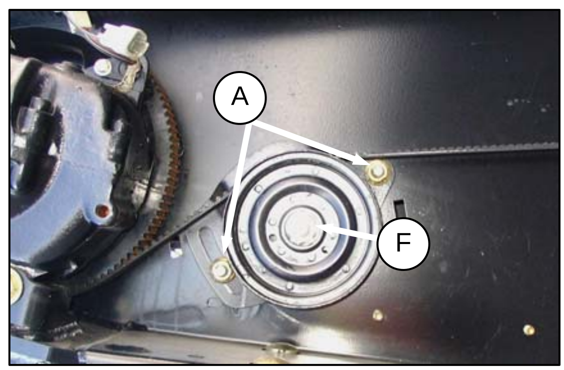


d. Check clearance between belt and belt guide (D). The measurement should be 0.02 - 0.04 in. (0.5 - 1.0 mm). Adjust as follows:

1. Ensure belt is properly tensioned.
2. Loosen bolts (E), and adjust position of guide as required.
3. Tighten bolts.

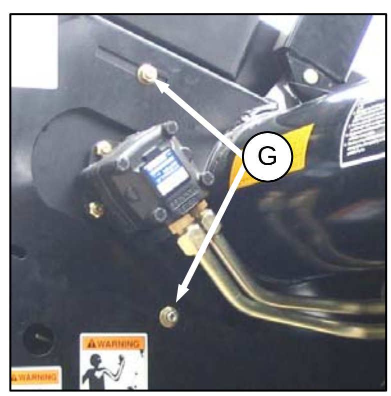
e. Re-adjust tension of a new belt after a short run-in period, (about 5 hours).

8.7.9.1.2 Removal - Left End Timing Belt



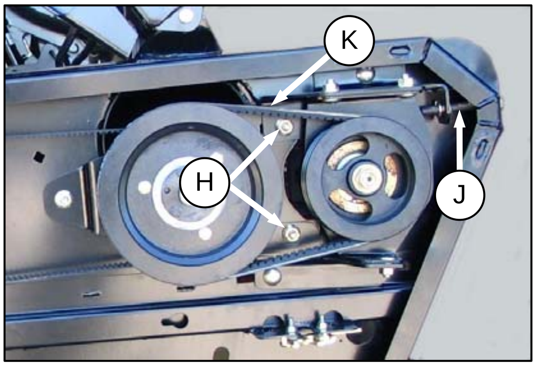
a. Loosen two nuts (A) on belt idler bracket to relieve tension on belt.

b. Loosen nut (F) on idler pulley, and slide idler down to loosen belt.



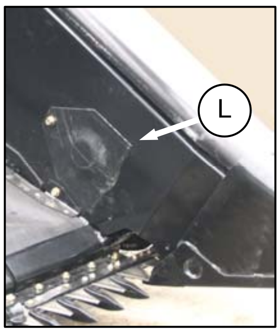
c. Loosen two bolts (G) on endsheet.

(continued next page)



d. Loosen two bolts (H) on sickle drive mounting bracket.

e. Turn adjuster bolt (J) to loosen the two V-belts (K), and remove belts.



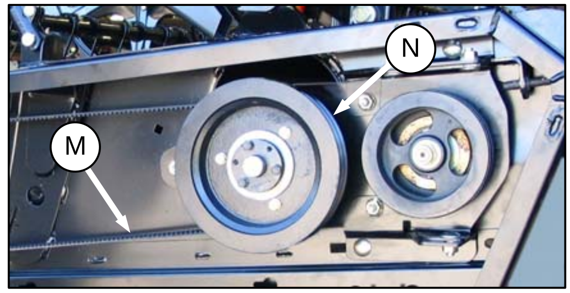
f. Remove bolt in plate (L) in left endsheet at wobble box, and remove the plate.

   This provides clearance between the pulley and endsheet for the belt when it is removed.

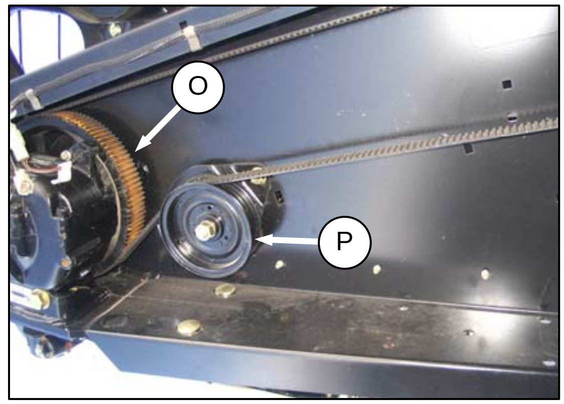
g. Slip timing belt off wobble box pulley, and route the belt between the wobble box pulley and the endsheet.

h. Remove belt from drive pulley.

8.7.9.1.3 Installation - Left End Timing Belt



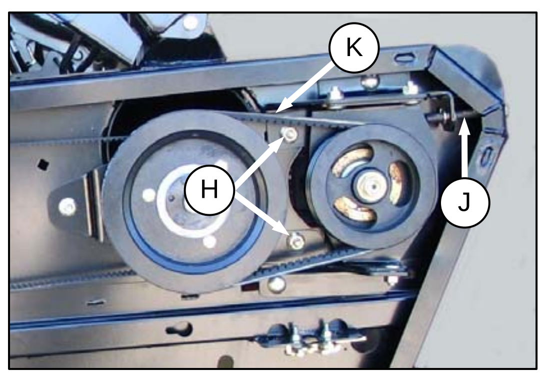
a. Locate timing belt (M) onto drive pulley (N).



b. Route belt between the wobble box pulley (O) and the endsheet, and locate on wobble box pulley and over idler (P).

NOTE

When installing new belt, never pry belt over pulley. Be sure adjusting device is fully loosened, then tension belt.



c. Position V-belts (K) onto drive pulleys.

d. Turn adjuster bolt (J) to move drive motor until a force of 12 lbf (53 N) deflects V-belts (K) 1/8 in. (3 mm) at mid-span.

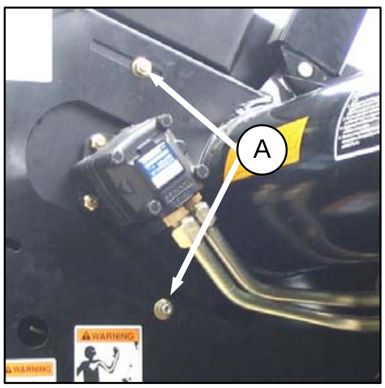
e. Tighten the two bolts (H) on drive mounting brackets.

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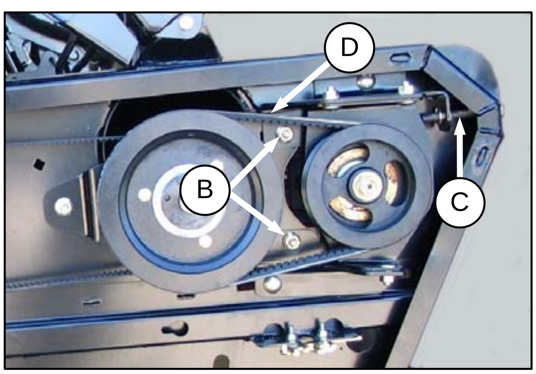
f. Tighten the two bolts (G) on the endsheet.
g. Slide idler (P) up until most of the belt slack is taken up. Tighten idler nut (F).
h. Adjust the timing belt tension, and check belt clearance to belt guide. See 8.7.9.1.1 Tension Adjustment - Timing Belt.
i. Re-install plate (L) in endsheet.
j. Re-install left endshield.
k. Re-adjust tension of a new belt after a short run-in period, (about 5 hours).



8.7.9.1.4 Tension Adjustment - Left End Double V-Belts



a. Loosen two bolts (A) on endsheet.



b. Loosen two bolts (B) on sickle drive mounting bracket.
c. Turn adjuster bolt (C) to move drive motor until a force of 12 lbf (53 N) deflects V-belts (D) 1/8 in. (3 mm) at mid-span.
d. Tighten bolts (A) and (B).
e. Re-adjust tension of a new belt after a short run-in period, (about 5 hours).

8.7.9.1.5 Removal - Left End V-Belts

Refer to illustrations opposite.

a. Loosen two bolts (A) on endsheet.
b. Loosen two bolts (B) on sickle drive mounting bracket.
c. Turn adjuster bolt (C) to loosen the two V-belts (D), and remove belts.

8.7.9.1.6 Installation - Left End V-Belts

Refer to illustrations opposite.

IMPORTANT

Sickle drive V-belts are a matched set. Replace both drive belts even if only one needs replacing. Do not pry belt over pulley, loosen adjusting device sufficiently to allow easy installation.

a. Slip belts (D) onto drive pulleys.
b. Turn adjuster bolt (C) to move drive motor until a force of 12 lbf (53 N) deflects V-belts (D) 1/8 in. (3 mm) at mid-span.
c. Tighten bolts (A) and (B) on drive mounting bracket.
d. Re-adjust tension of a new belt after a short run-in period, (about 5 hours).

8.7.9.2 Right End Drive

CAUTION

To avoid personal injury, before servicing machine or opening drive covers, follow procedures in Section 8.1 PREPARATION FOR SERVICING.

8.7.9.2.1 Tension Adjustment - Timing Belt

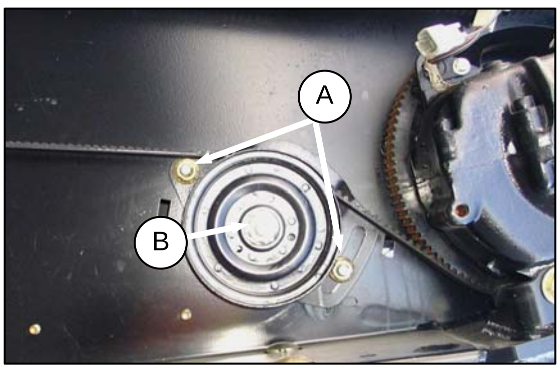
IMPORTANT

To prolong belt and drive life, do not over-tighten belt.

Refer to 8.7.9.1.1 Tension Adjustment - Timing Belt.

8.7.9.2.2 Removal - Right End Timing Belt

a. Open right endshield.

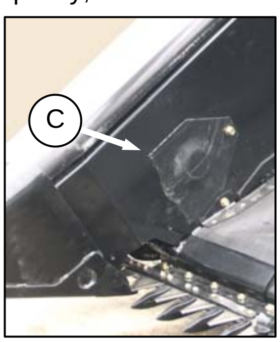


b. Loosen two nuts (A) on belt idler bracket, to relieve tension on belt.

c. Loosen nut (B) on idler pulley, and slide idler down to loosen belt.

d. Remove bolt in plate (C) in right endsheet at wobble box, and remove the plate.

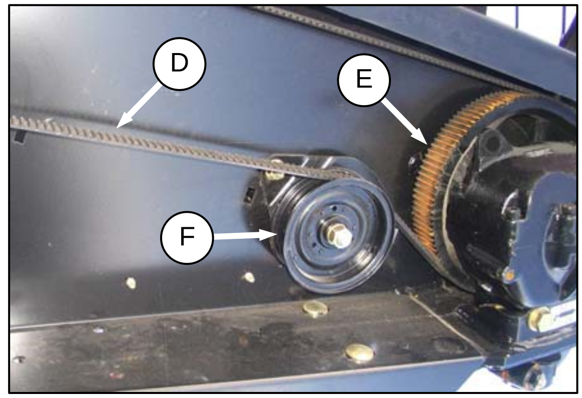
This provides clearance between the pulley and endsheet for the belt when it is removed.



e. Slip timing belt off wobble box pulley, and route the belt between the wobble box pulley and the endsheet.

f. Remove belt from drive pulley.

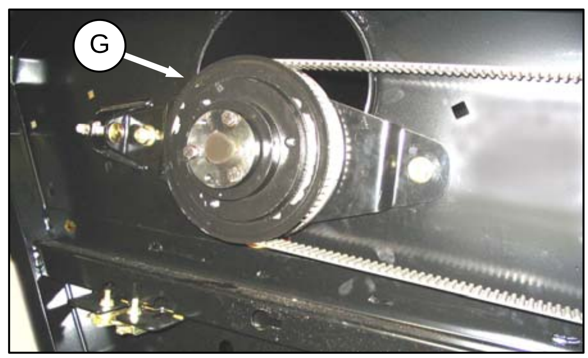
8.7.9.2.3 Installation - Right End Timing Belt



a. Route timing belt (D) between the wobble box pulley (E) and the endsheet, and locate on wobble box pulley, and over idler (F).

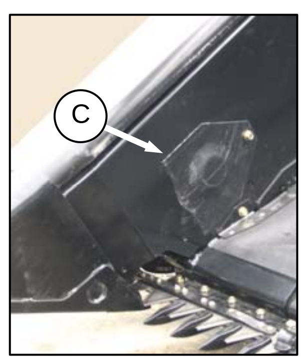
NOTE

When installing new belt, never pry belt over pulley. Be sure adjusting device is fully loosened, then tension belt.



b. Position timing belt on drive pulley (G).

c. Adjust the timing belt tension, and check belt clearance to belt guide. See 8.7.9.1.1 Tension Adjustment - Timing Belt.



d. Re-install plate (C) in endsheet.

e. Close left endshield.

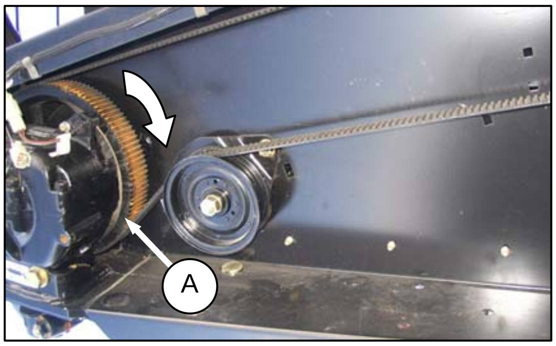
f. Re-adjust tension of a new belt after a short run-in period, (about 5 hours).

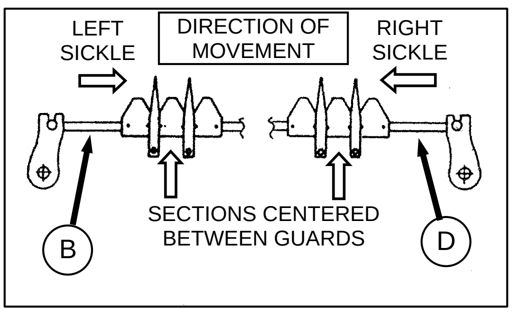
8.7.9.3 Sickle Drive Timing

Double knife D60 Harvest Headers 35 FT. and smaller require that the sickles are properly timed to move in opposite directions.

To adjust the sickle timing, proceed as follows:

a. Remove the right sickle drive belt. Refer to Section 8.7.9.2.2 Removal - Right End Timing Belt.

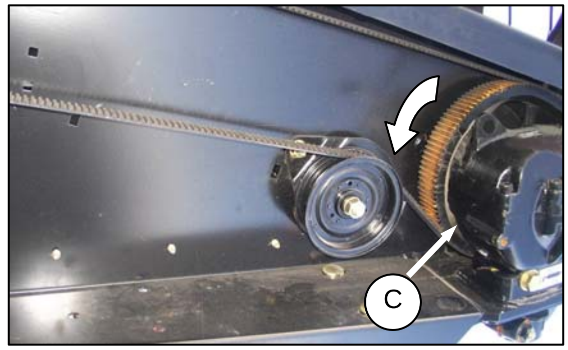


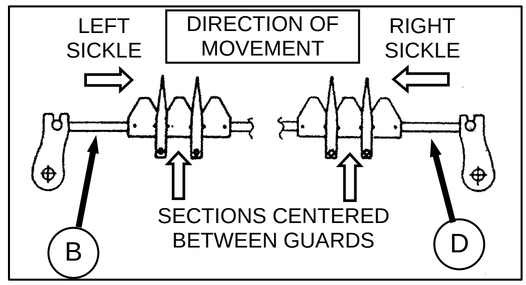


b. Rotate the left wobble box driven pulley (A) <u>clockwise</u> until the left sickle (B) is at the center of the inboard stoke (moving towards center of header).

<u>NOTE</u>

<u>Center</u> stroke is when the sickle sections are centered between guard points as shown.





c. Rotate the right wobble box pulley (C) <u>counter clockwise</u> until the right sickle (D) is at the center of the inboard stroke.

d. Install the right wobble box drive belt, and adjust tension. Refer to Section 8.7.9.2.3 Installation - Right End Timing Belt.

IMPORTANT

To maintain timing, wobble box driver and driven pulleys must not rotate as the belt is tightened.

e. Check that the timing belts are properly seated in the grooves on both driver and driven pulleys.

f. Check for correct sickle timing by rotating the drive slowly by hand, and observe sickles where they overlap at the center of the header.

IMPORTANT

Sickles must move in opposite directions, and must begin moving at exactly the same time.

If timing is off, proceed as follows:

1. Loosen right belt sufficiently to allow skipping the belt one or more teeth as required. Refer to Section 8.7.9.2.1 Tension Adjustment - Timing Belt.
2. If right sickle “leads” left sickle, rotate RIGHT SIDE driven pulley (C) clockwise.
3. If right sickle “lags” left sickle, rotate RIGHT SIDE driven pulley (C) counter clockwise.
4. Tighten right belt.

8.7.10 WOBBLE BOX

CAUTION

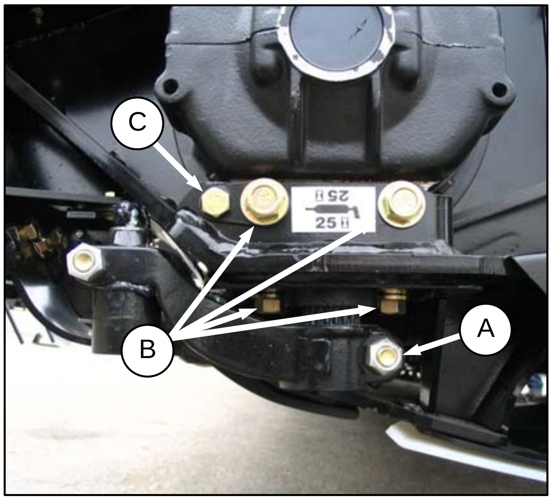
To avoid personal injury, before servicing machine or opening drive covers, follow procedures in Section 8.1 PREPARATION FOR SERVICING.

8.7.10.1 Mounting Bolts

Check four wobble box mounting bolts (B) torque after the first 10 hours operation, and every 100 hours thereafter. Torque should be 200 ft·lbf (270 N·m). When tightening, start with the side mounting bolts.

8.7.10.2 Wobble Box Removal

a. Loosen sickle drive belt, and slip off wobble box pulley. Refer to Section 8.7.8 Sickle Drive Belts - Non-Timed Drive and 8.7.9 Sickle Drive Belts - Timed Drive.
b. Remove sickle head pin. Refer to Section 8.7.2 Sickle Removal, steps a. and b.

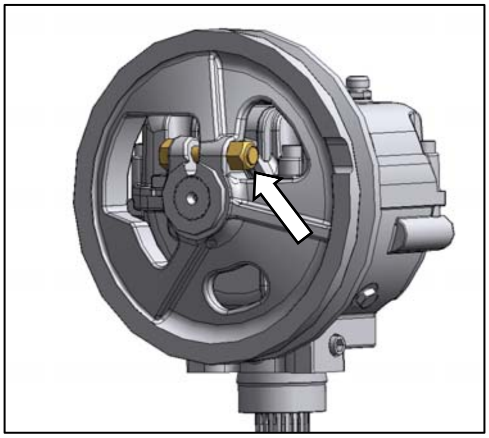


c. Remove bolt (A) from pitman arm.
d. Remove pitman arm from wobble box shaft.
e. Remove bolts (B) attaching wobble box to frame.

IMPORTANT
Do not remove or loosen locating tab (C). This is a factory adjustment.

f. Remove wobble box.

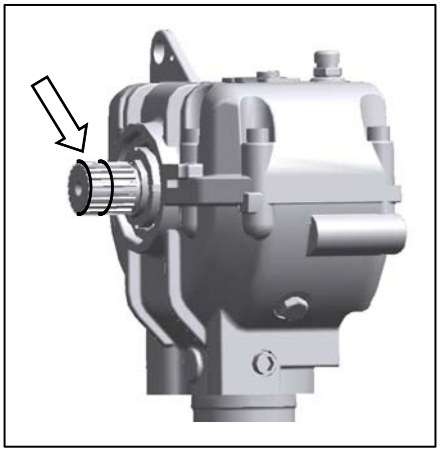
8.7.10.3 Pulley Removal



a. Loosen nut and bolt from pulley.
b. Remove pulley using a 3-jaw puller.

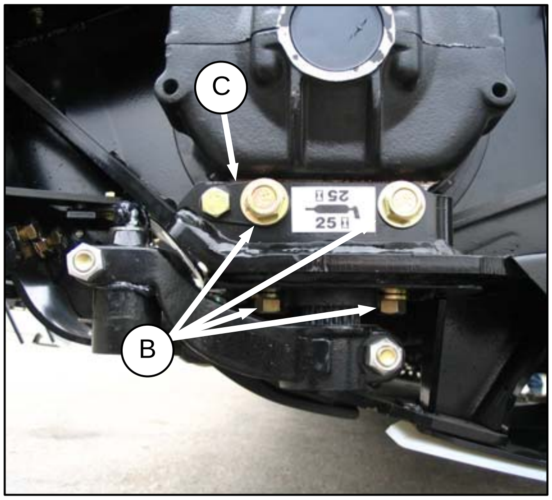
8.7.10.4 Pulley Installation

a. Remove any rust or paint from shaft and pulley splines. For replacement parts, remove oil/grease with degreasing agent.

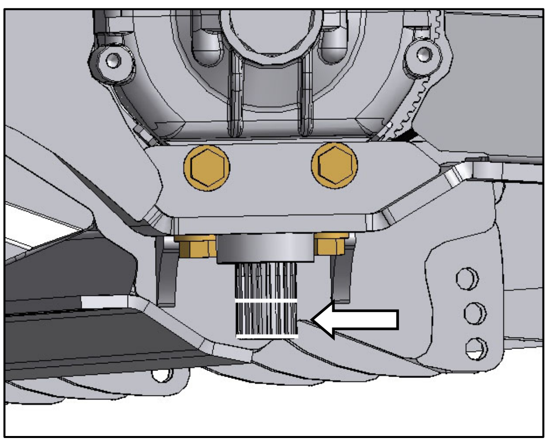


b. Apply Loctite® #243 adhesive (or equivalent) to spline. Apply in two bands around shaft as shown, with one band at end of spline, and one band approximately “mid-way”.
c. Install pulley on shaft until flush with end of shaft, and secure with bolt and nut. Torque bolt to 160 ft·lbf (217 N·m).

8.7.10.5 Wobble Box Installation

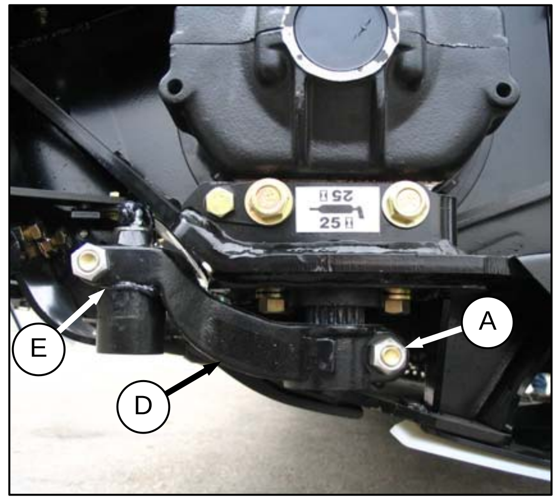


a. Position wobble box with locating tab (C) at original position, and install four bolts (B). Torque side bolts, and then bottom bolts to 200 ft·lbf (270 N·m).



b. Apply Loctite® #243 adhesive (or equivalent) to spline. Apply in two bands around shaft as shown, with one band at end of spline, and one band approximately "mid-way".

c. Remove any rust or paint from pitman arm splines. For replacement parts, remove oil/grease with degreasing agent.



d. Slide pitman arm (D) onto output shaft.

e. Slide arm up or down on shaft until it "just" contacts knifehead [0.010 in. (0.25 mm) gap] (E).

f. Rotate pulley to ensure drive arm just clears frame to ensure proper placement on splines. Position pitman arm at furthest outboard position.

g. Install bolt (A) and nut, and torque to 160 ft·lbf. (217 N·m).

h. Install sickle head pin. Refer to Section 8.7.4 Sickle Installation.

i. Install drive belt onto wobble box pulley and tighten. Refer to Section 8.7.8 Sickle Drive Belts - Non-Timed Drive and 8.7.9 Sickle Drive Belts - Timed Drive.

8.7.10.6 Changing Oil

NOTE

Change wobble box lubricant after the first 50 hours operation and every 1000 hours (or 3 years) thereafter.

a. Raise header to allow a suitable container to be placed under wobble box drain to collect oil.

b. Open endshield(s).



c. Remove breather/dipstick, and drain plug.

d. Re-install drain plug, and add 2.3 U.S. quarts (2.2 litres) SAE 85W-140 oil to required level.

e. Close endshield(s).

8.8 DRAPERS

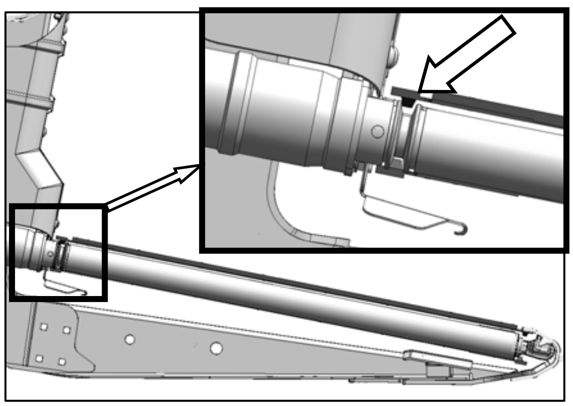
CAUTION

To avoid personal injury, before servicing machine or opening drive covers, follow procedures in Section 8.1 PREPARATION FOR SERVICING.

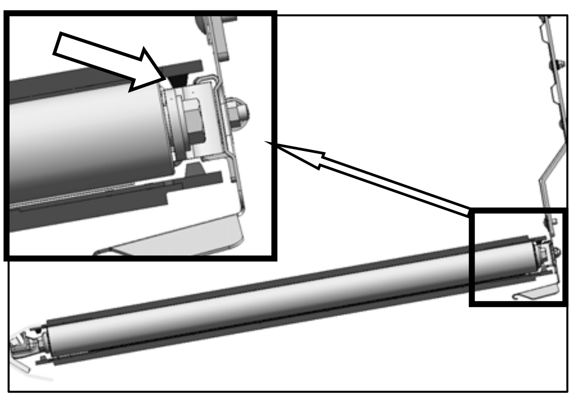
8.8.1 DRAPER TENSION ADJUSTMENT

Draper tension should be just enough to prevent slipping and keep draper from sagging below cutterbar.

Set draper tension as follows:



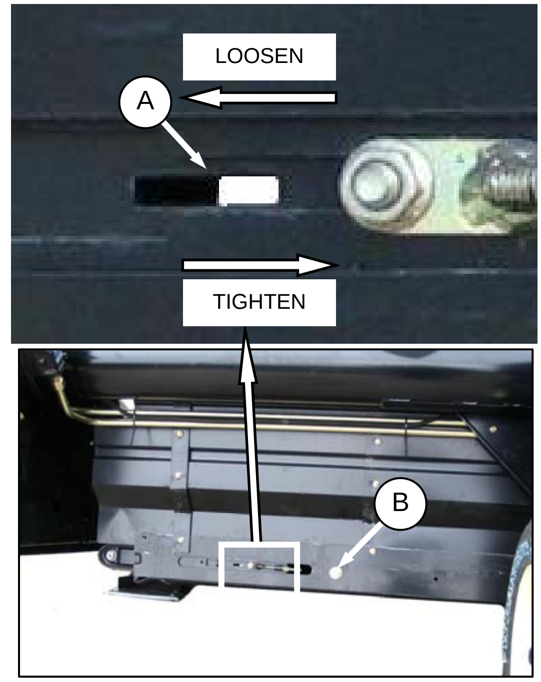
DRIVE ROLLER



IDLER ROLLER

a. Check that draper guide (rubber track on underside of draper) is properly engaged in groove of drive roller, and that idler roller is between the guides.

b. If required, set draper tension as follows:



1. Turn bolt (B) clockwise (tighten) and white indicator bar (A) will move "inboard" in direction of arrow to indicate that draper is tightening.
2. Turn bolt (B) counter clockwise (loosen) and white indicator bar (A) will move "outboard" in direction of arrow to indicate that draper is loosening.
3. Adjust until bar is about "halfway" in window.

IMPORTANT

To avoid premature failure of draper, draper rollers and/or tightener components, do not operate with tension set so that white bar is not visible.

Also to prevent the draper from scooping dirt, ensure draper is tight enough that it does not sag below point where cutterbar contacts the ground.

8.8.2 REPLACING SPLIT DRAPER

The draper should be replaced or repaired if it is torn, missing slats, or cracked.

CAUTION

To avoid bodily injury from fall of raised reel, always engage reel props before going under raised reel for any reason.

DANGER

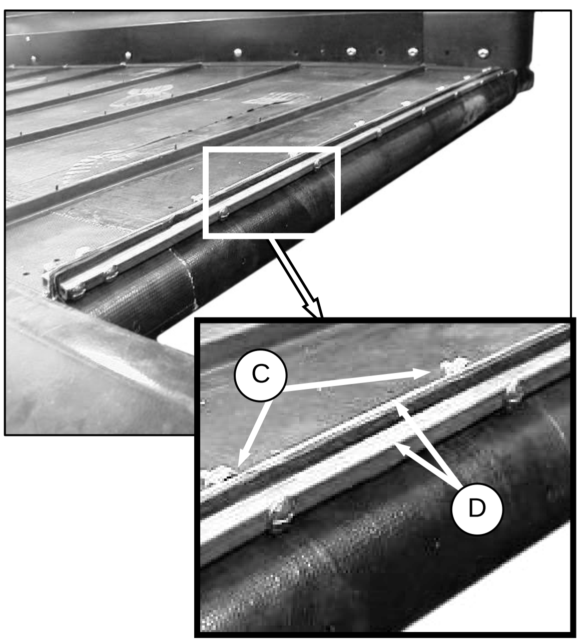
To avoid bodily injury or death from unexpected start-up or fall of raised machine, stop engine, remove key and engage lift cylinder locks before going under machine for any reason.

8.8.2.1 Draper Removal

a. Raise reel, and engage reel props.
b. Raise header, and install lift cylinder locks.
c. Stand in draper opening, and move draper until draper joint is in work area.

NOTE
Deck can also be shifted towards center to provide opening at endsheet.

d. Release tension on the draper. Refer to previous section.

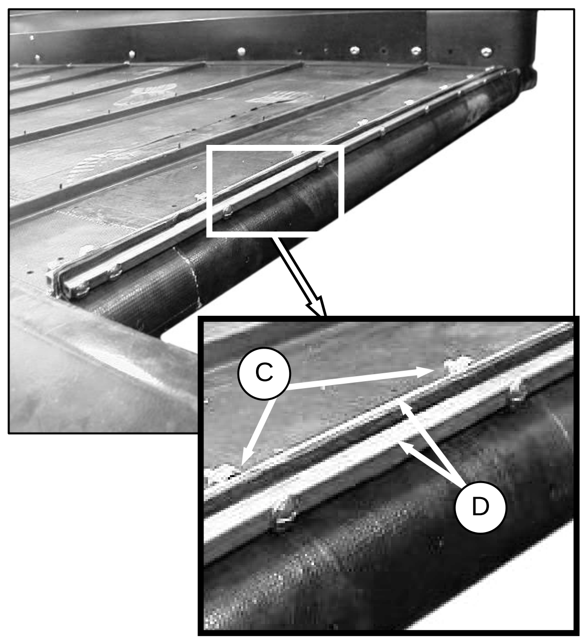


e. Remove nuts (C), and tube connectors (D) at draper joint.
f. Pull draper from deck.

8.8.2.2 Draper Installation



a. Insert draper into deck at outboard end, under the rollers. Pull draper into deck, while feeding it at the end.
b. Feed in the draper until it can be wrapped around the drive roller.
c. Similarly insert the other end into the deck over the rollers. Pull draper fully into the deck.
d. Attach ends of draper with tube connectors (D).



e. Install screws (C) with heads facing the center opening.
f. Adjust tension. Refer to Section 8.8.1 Draper Tension Adjustment.

8.8.3 REPLACING ENDLESS DRAPER

The draper should be replaced or repaired if it is torn, missing slats, or cracked.

CAUTION

To avoid bodily injury from fall of raised reel, always engage reel props before going under raised reel for any reason.

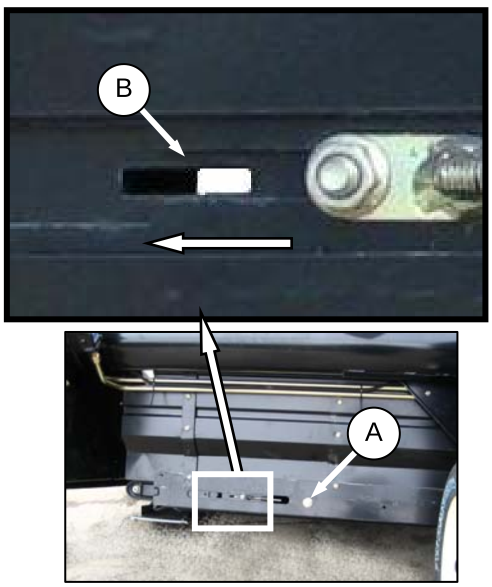
DANGER

To avoid bodily injury or death from unexpected start-up or fall of raised machine, stop engine, remove key and engage lift cylinder locks before going under machine for any reason.

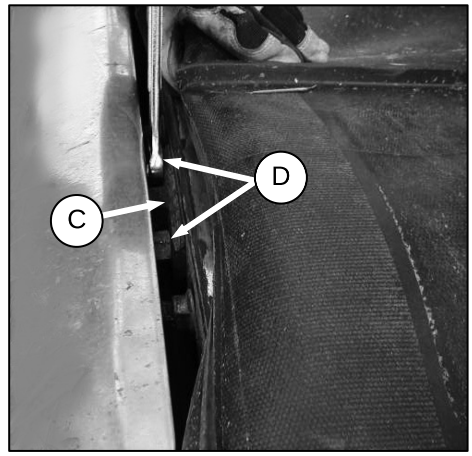
8.8.3.1 Endless Draper Removal

a. Raise reel, and engage reel props.

b. Raise header, and install lift cylinder locks.



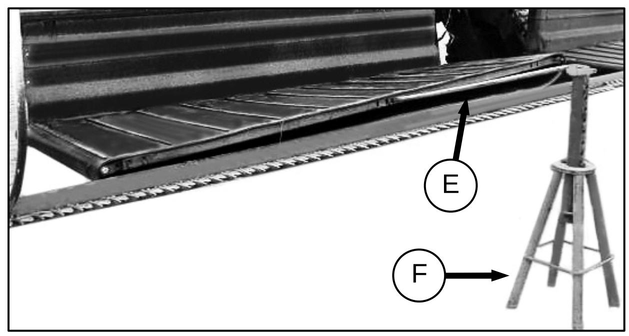
c. Turn bolt (A) counter clockwise to "fully loosen" draper. White indicator bar (B) will move "outboard" in direction of arrow to indicate that draper is loosening.



d. Push draper away from cutter bar (as shown) to expose deck supports (C). There are two or three supports, depending on header size.

e. Remove the two center nuts (D) at each support.

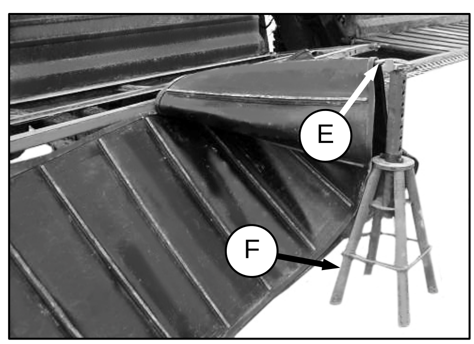
f. Move deck away from cutterbar to disengage deck supports.



g. Insert a pry bar (E) in hole in deck located at approximately the deck "mid-point", and lift deck clear of cutter-bar.

NOTE

Pry bar should be of sufficient length to accommodate width of draper.

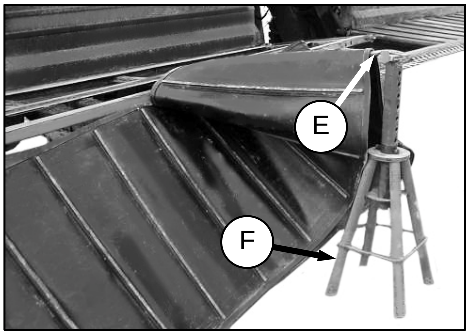


h. Support pry bar on a stand (F) of suitable height.

i. Pull draper off deck onto pry bar.

j. Remove stand, and remove draper and pry bar.

8.8.3.2 Endless Draper Installation

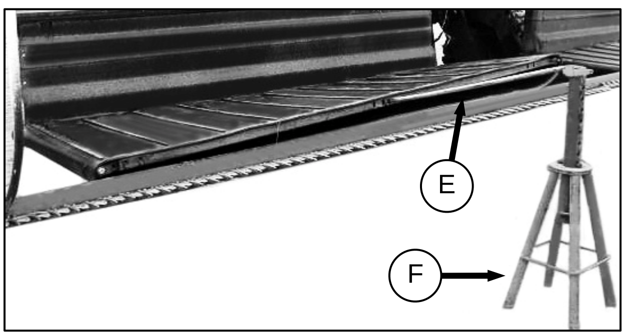


a. Insert a pry bar (E) through draper, and locate bar in hole in deck located at approximately the deck “mid-point”.

NOTE

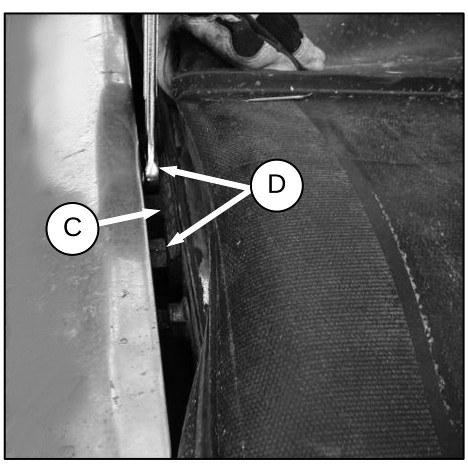
Pry bar should be of sufficient length to accommodate width of draper.

b. Lift deck clear of cutter-bar, and support bar on a stand (F) of suitable height.



c. Slide draper onto deck.

d. Lift deck, remove stand (F), and lower deck into position. Remove pry bar (E).



e. Line up deck supports (C) with bolts in deck.

f. Move deck towards cutterbar to engage deck supports.

g. Install nuts (D), and tighten.

h. Adjust draper tension. Refer to Section 8.8.1 Draper Tension Adjustment.

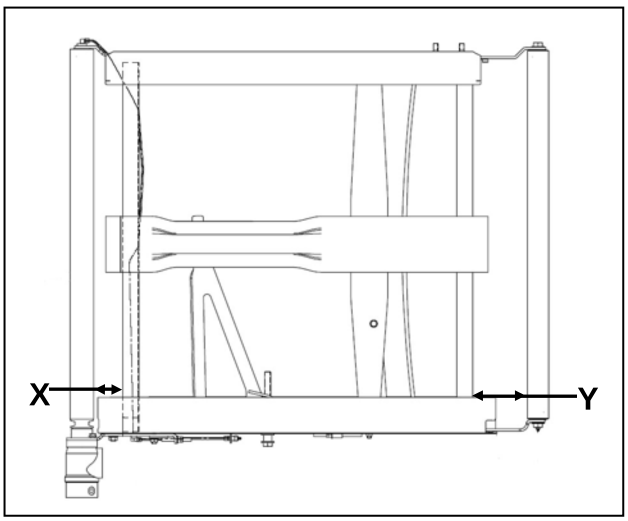
8.8.4 DRAPER ALIGNMENT

Each draper deck has one fixed roller and one spring-loaded roller. The spring-loaded roller is located at the same end of the deck as the draper tensioner. Both rollers can be aligned by adjuster rods so that the draper tracks properly on the rollers.

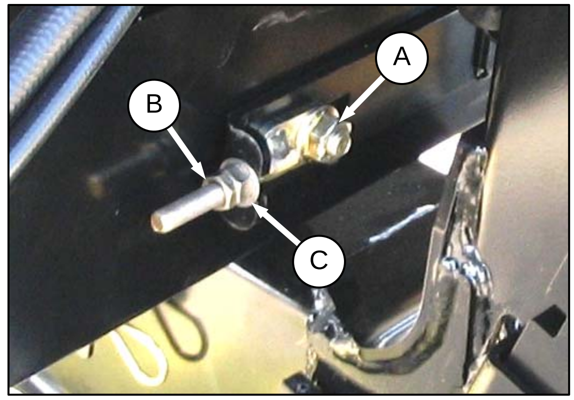
CAUTION

To avoid personal injury, before servicing machine or opening drive covers, follow procedures in Section 8.1 PREPARATION FOR SERVICING.

If the draper is tracking inc orrectly, make the following adjustments to the rollers.

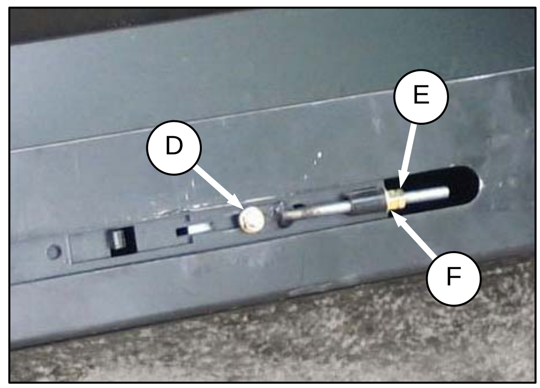


TRACKING	AT LOCATION	ADJUSTMENT	METHOD
Backward	Drive Roller	INCREASE **'X'**	Tighten Nut 'C'
Forward		DECREASE **'X'**	Loosen Nut 'C'
Backward	Idler Roller	INCREASE '**Y**'	Tighten Nut 'F'
Forward		DECREASE **'Y'**	Loosen Nut 'F'



LH DRIVE ROLLER ADJUST - RH OPPOSITE

a. Adjust the drive roller 'X' by loosening nuts (A), jam-nut (B) on adjuster rod, and turning adjusting nut (C).



LH IDLER ROLLER ADJUST - RH OPPOSITE

b. Adjust the idler roller 'Y' by loosening nut (D), jam-nut (E) on adjuster rod, and turning adjusting nut (F).

c. If the draper will not track at the idler roller end, the drive roller is likely not "square" to the deck. Adjust the drive roller, and then re-adjust the idler.

8.8.5 DRAPER ROLLER MAINTENANCE

The draper rollers have non-greaseable bearings. The external seal should be checked every 200 hours (or more frequently in sandy conditions), to obtain the maximum bearing life.

DANGER

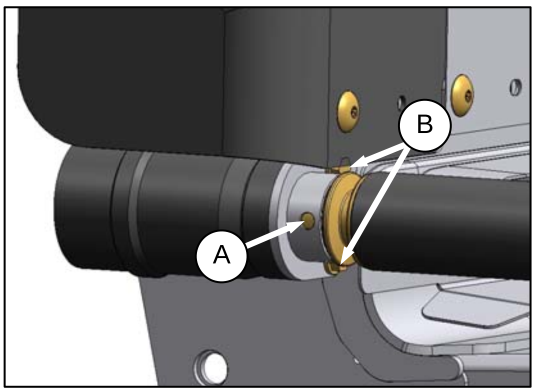
Engage header lift cylinder stops and reel props before working under header or reel.

8.8.5.1 Drive Roller Removal

a. Raise header and reel, and engage cylinder and reel stops.

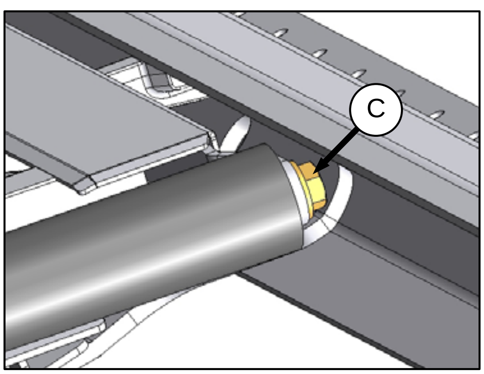
b. On deck shift headers, position deck so drive roller is easily accessible.

c. Loosen and uncouple draper. Refer to Section 8.8.2 Replacing Split Draper.



d. Loosen the two set screws in access hole (A) in the drive roller hub at motor end.

e. Remove the two bolts (B) that hold hydraulic motor to arm, and pull motor off roller.



f. Remove bolt (C) at forward end of roller, and remove roller from deck.

8.8.5.2 Drive Roller Installation

DANGER

Engage header lift cylinder stops and reel props before working under header or reel.

Refer to illustrations opposite.

a. Position roller in deck arms, and secure forward end with bolt (C) and washer. Do **not** tighten at this time.

b. Apply SAE Multi-Purpose grease to motor shaft, locate motor on roller arm, and engage motor shaft into roller.

c. Secure motor with bolts (B), and tighten.

d. Push roller against shoulder on motor shaft, and hand-tighten the two set screws (A). Torque set screws to 20 ft·lbf (27 N·m).

e. Torque bolt (C) to 70 ft·lbf (95 N·m).

f. Re-attach draper. Refer to Section 8.8.2 Replacing Split Draper.

g. Adjust draper tension. Refer to Section 8.8.1 Draper Tension Adjustment.

h. Re-adjust hydraulic motor hoses if required, and tighten hose clamps.

i. Run machine, and adjust tracking if required. Section 8.8.4 Draper Alignment.

8.8.5.3 Idler Roller Removal

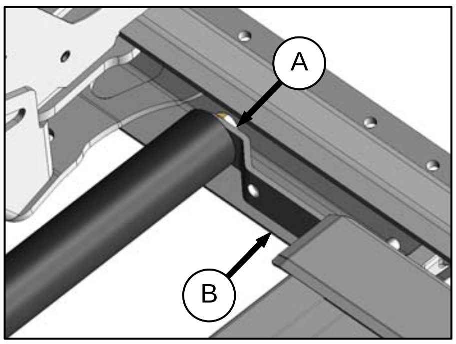
DANGER

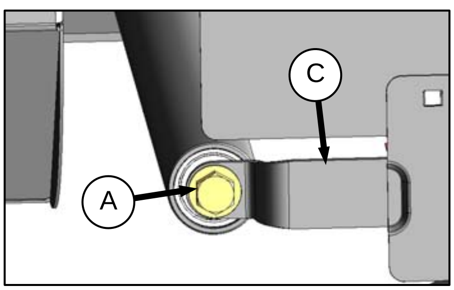
Engage header lift cylinder stops and reel props before working under header or reel.

a. Raise header and reel, and engage cylinder and reel stops.

b. On deck shift headers, position deck so idler roller is easily accessible.

c. Loosen and uncouple draper. Refer to Section 8.8.2.1 Draper Removal.





d. Remove bolts (A) and washer at ends of idler roller.

e. Spread roller arms (B) and (C), and remove roller.

8.8.5.4 Idler Roller Installation

See illustration opposite.

a. Position stub shaft in idler roller in forward arm (B) on deck.

b. Push on roller to deflect forward arm slightly so that stub shaft at rear of roller can be slipped into rear arm (C).

c. Install bolts (A) with washers, and torque to 70 ft·lbf (93 N·m).

d. Re-attach draper. Refer to Section 8.8.2 Replacing Split Draper.

e. Adjust draper tension. Refer to Section 8.8.1 Draper Tension Adjustment.

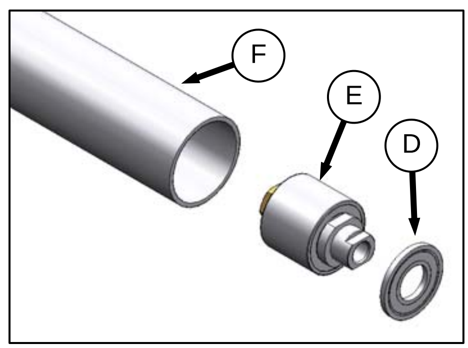
f. Run machine and adjust tracking if required. Section 8.8.4 Draper Alignment.

8.8.5.5 Draper Roller Bearing/Seal Replacement

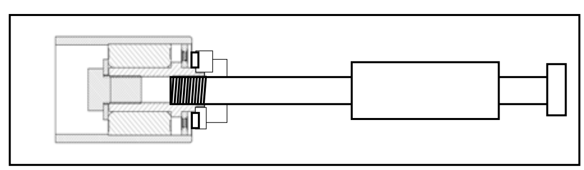
NOTE

Seal (D) not included in D50 header.

a. Remove roller assembly. Refer to Section 8.8.5.1 Drive Roller Removal or Section 8.8.5.3 Idler Roller Removal.



b. Remove bearing assembly (E) and seal (D) from roller tube (F) as follows:



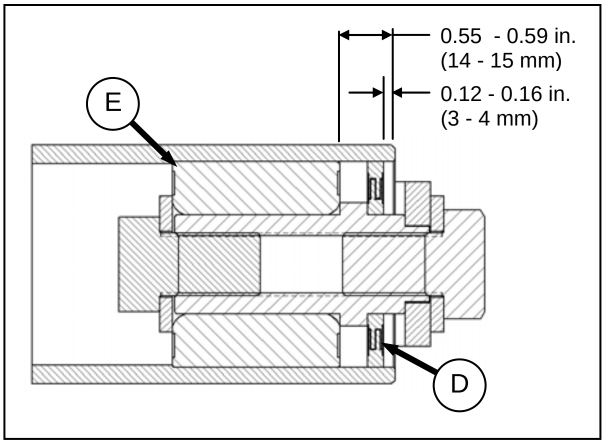
1. Attach a slide hammer to threaded shaft.
2. Tap out the bearing assembly.

c. Clean inside of roller tube (F). Check tube for wear or damage. Replace if necessary.

(continued next page)

d. Install bearing and seal as follows:

1. Install bearing assembly (E) into roller by pushing on outer race of bearing. The bearing is fully positioned when the 0.55 inch (14 mm) dimension is achieved. See illustration below.



2. Apply grease in front of bearing. Refer to Section 8.3.4 Recommended Fluids and Lubricants.

e. Install seal (D) as follows:

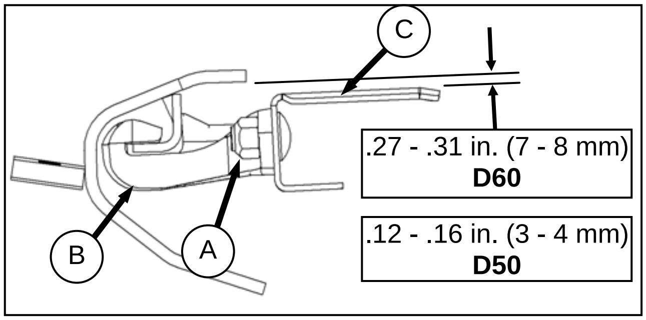
1. Locate seal at roller opening, and position a flat washer (1.0 inch I.D. X 2.0 in. O.D.) on seal.
2. Using a suitable socket to locate on the washer, tap seal into roller opening until it seats on the bearing assembly. The seal is fully positioned when the 0.12 in. (3 mm) dimension is achieved. See illustration above.

f. Re-install roller assembly. Refer to Section 8.8.5 Draper Roller Maintenance.

8.8.6 DECK HEIGHT

To prevent material from entering drapers and cutterbar, maintain deck height so that draper runs just below cutterbar with maximum 1/32 in. (1 mm) gap, or with draper deflected down slightly (up to 1/16 in. (1.5 mm)) to creat e a seal.

The illustration shows the adjustment without the draper.



NOTE

Measurement is at supports with header in working position, and decks slid fully ahead.

Adjust as follows:

DANGER

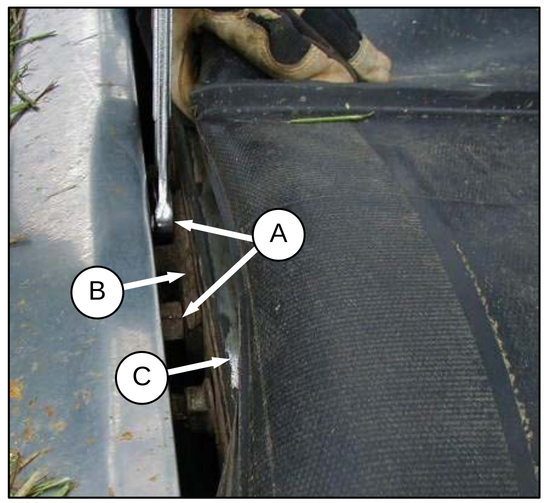
Engage header lift cylinder stops and reel props before working under header or reel.

DANGER

To avoid bodily injury or death from unexpected start-up or fall of raised machine, stop engine, remove key, and engage lift cylinder locks before going under machine for any reason.

a. Loosen tension on drapers. Refer to Section 8.8.1 Draper Tension Adjustment.

b. Lift draper up at front edge past cutterbar.



c. Loosen two lock-nuts (A) a “half-turn” only on deck support (B). There are two to four supports per deck, depending on header size.

d. Tap deck (C) to lower deck relative to supports to achieve setting recommended above. Tap support (B) using a punch to raise deck relative to support.

e. Tighten deck support hardware (A).

f. Tension drapers. Refer to Section 8.8.1 Draper Tension Adjustment.

8.9 REEL AND REEL DRIVE

CAUTION

To avoid personal injury, before servicing header or opening drive covers, follow procedures in Section 8.1 PREPARATION FOR SERVICING.

8.9.1 REEL CLEARANCE TO CUTTERBAR

The finger to guard/cutterbar clearances with reel fully lowered varies with header width, and are as follows. See illustration opposite.

HEADER	'X' +/- .12 in. (3 mm) @ ENDSHEETS	
	SINGLE REEL	DOUBLE REEL
15 FT.	0.78 in. (20 mm)	---
20 FT.		
25 FT.	1.00 in. (25 mm)	
30 FT.	1.77 in. (45 mm)	0.78 in. (20 mm)
35 FT.	2.36 in. (60 mm)	
40 FT.	---	

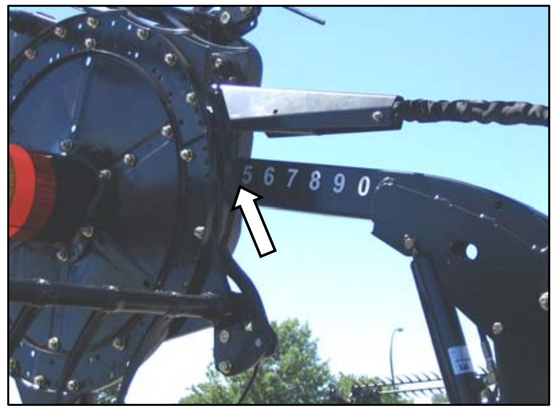
8.9.1.1 Clearance Measurement

DANGER

To avoid bodily injury or death from unexpected start-up or fall of raised machine, stop engine, remove key and engage lift cylinder locks before going under machine for any reason.

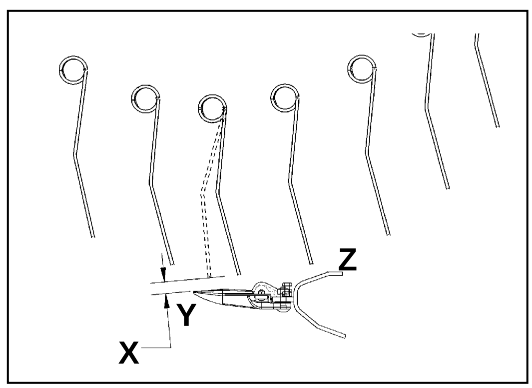
a. Raise header, engage header lift cylinder stops, and lower header onto stops.

b. Lower the reel fully.



D60

c. Adjust fore-aft reel position so that back end of cam disc is approximately between 4 and 5 on the arm decal.



d. Measure clearance **'X'** at ends of each reel.

NOTE

The reel has been adjusted at the factory to provide more clearance at the center of the reel than at the ends (frown) to compensate for reel flexing.

e. Check all possible points of contact between points **'Y'** and **'Z'**. Depending on reel fore-aft position, minimum clearance can occur at guard tine, hold-down or cutterbar.

f. If adjustment is required, refer to following section.

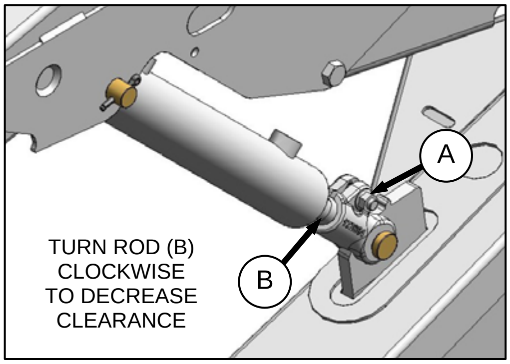
8.9.1.2 Reel Clearance Adjustment

DANGER

Engage header lift cylinder stops before working under header.

a. Raise header, engage header lift cylinder stops, and lower header onto stops.

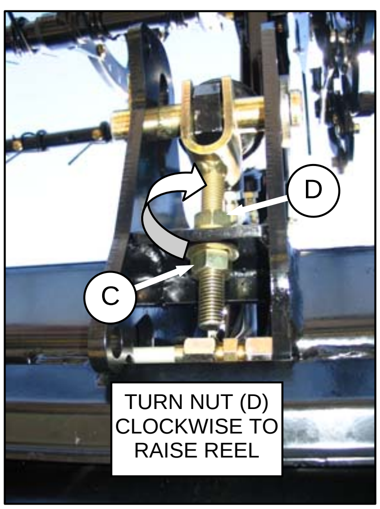
b. Lower the reel fully.



c. Adjust outside arms as follows:

1. Loosen bolt (A).
2. Turn cylinder rod (B) counter clockwise to raise reel and increase clearance to cutterbar, or clockwise to decrease.
3. Tighten bolt (A).
4. Repeat at opposite side.

d. For split reels (D60 only), adjust center arm as follows:



LOOKING UP AT ARM UNDERSIDE

1. Loosen nut (C), and turn nut (D) clockwise to raise reel and increase clearance to cutterbar, or counter clockwise to decrease.
2. Tighten nut (C).

8.9.2 REEL FROWN ADJUSTMENT

The reel has been adjusted at the factory to provide more clearance at the center of the reel than at the ends (frown) to compensate for reel flexing. The frown adjustment compensates for reel flexing.

The “frown” is adjusted by re-positioning the hardware connecting reel finger tube arms to reel discs.

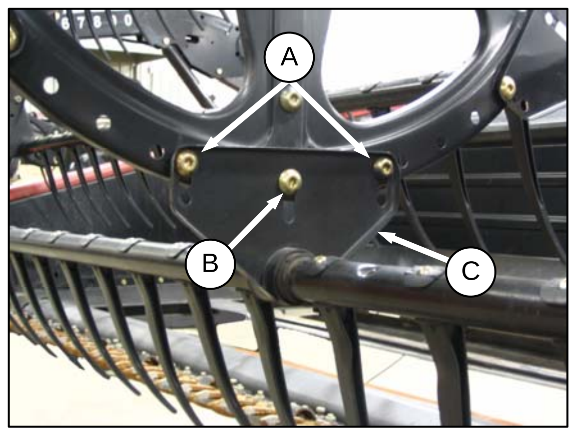
IMPORTANT

The “frown” profile should be measured prior to reel disassembly for servicing so that the profile can be maintained after re-assembly.

a. Position the reel over the cutterbar (4 - 5 on the gauge). This position provides adequate clearance at all reel fore-aft positions. Refer to Section 7.12.9 Reel Fore-Aft Position.

b. Take a measurement at each reel disc location for each reel tube.

c. Adjust the profile as follows: Start with the reel disc set closest to center of header, and proceed to the ends.



1. Remove bolts (A).
2. Loosen bolt (B), and adjust arm (C) until desired measurement is obtained between reel tube and cutterbar.

NOTE

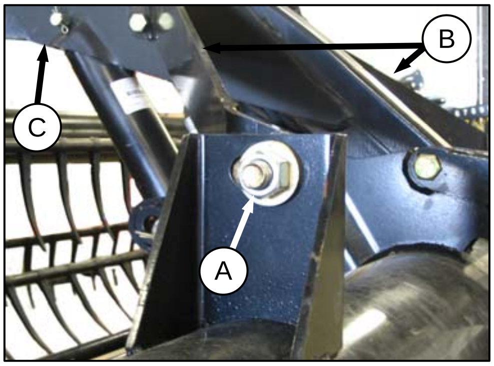
Allow the reel tubes to find a natural curve and position the hardware appropriately

3. Re-install bolts (A) in aligned holes, and tighten.

8.9.3 REEL CENTERING

8.9.3.1 Double Reel Headers

The reels should be centered between the endsheets.

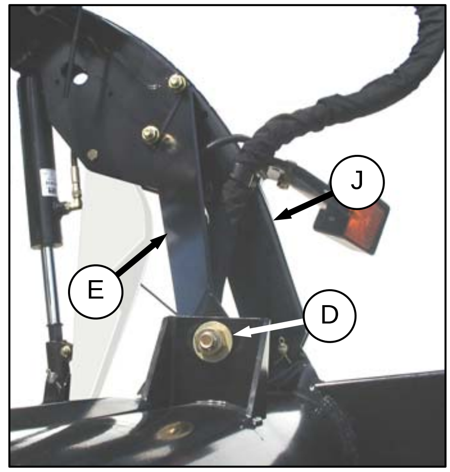


D60

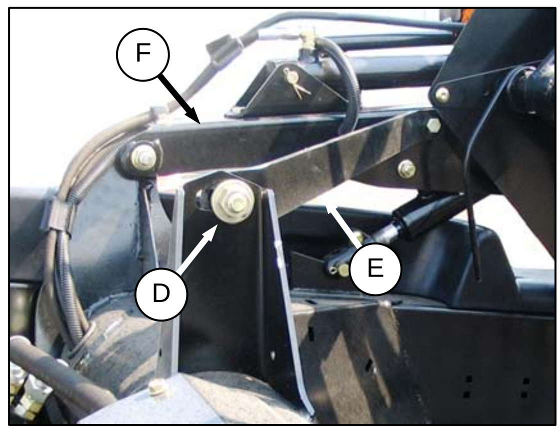
a. Loosen bolt (A) on each brace (B).
b. Move forward end of reel center support arm (C) laterally as required to center both reels.
c. Tighten bolts (A), and torque to 265 ft·lbf (359 N·m).

8.9.3.2 Single Reel Headers

The reel should be centered between the endsheets.



D60



D50

a. Loosen bolt (D) on brace (E) at both ends of reel.
b. Move forward end of reel support arm (F) laterally as required to center reel.
c. Tighten bolts (D), and torque to 265 ft·lbf (359 N·m).

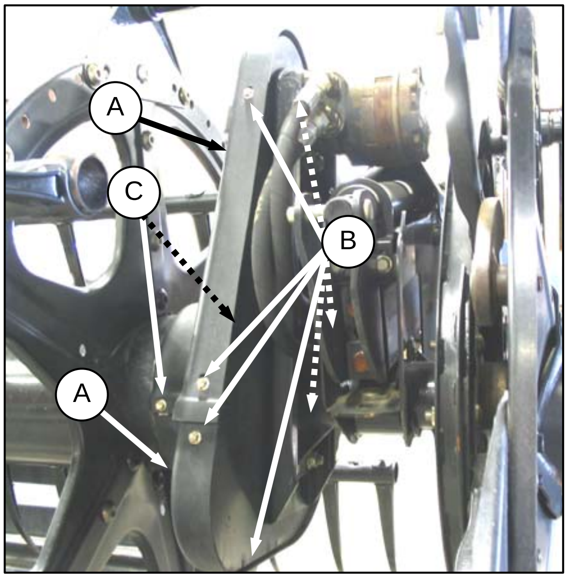
8.9.4 REEL DRIVE CHAIN - D60

8.9.4.1 Tension Adjustment

DANGER

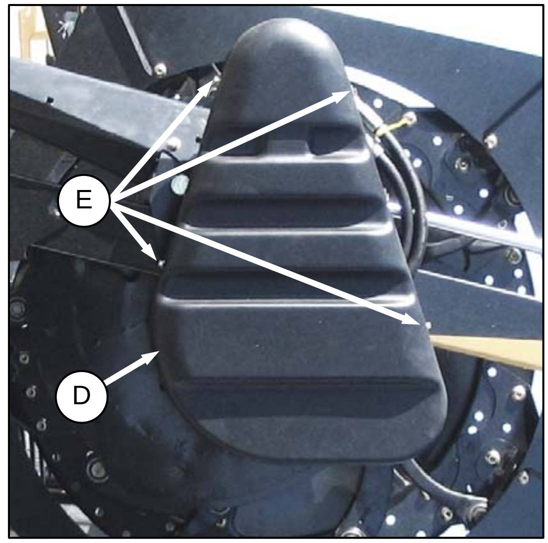
To avoid bodily injury from fall of raised reel, always engage reel props before going under raised reel for any reason.

a. Lower header, raise reel, and engage reel props .



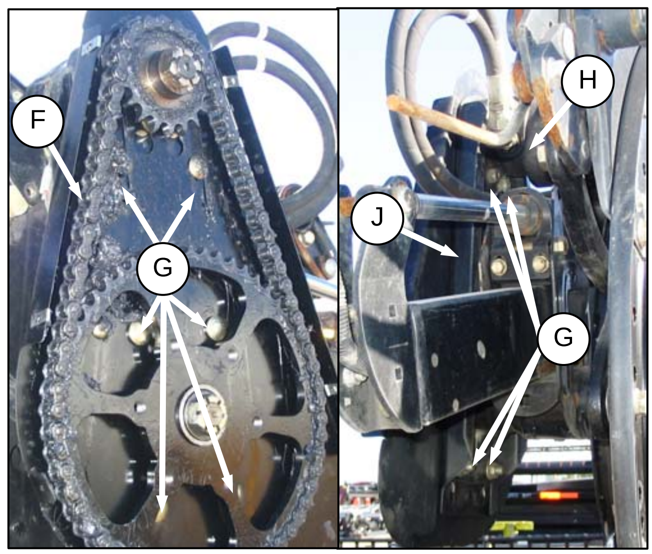
DOUBLE REEL

b. On double reel headers, the drive is located on the center reel arm. Remove drive cover (A) by removing seven screws (B) and two screws (C). The cover comes off in two pieces



SINGLE REEL - D60 ONLY

c. On 60 single reel headers, the drive is located on the right outside arm. Remove the one piece cover (D) by removing four screws (E).



SINGLE REEL SHOWN - DOUBLE REEL SIMILAR

d. The tension on the chain (F) should be such that hand force deflects the chain 1/8 inch (3 mm) at mid-span. Adjust as follows:

1. Loosen six bolts (G) on motor mount.
2. Slide the motor (H) and motor mount (J) until the required tension is achieved.
3. Tighten bolts (G) to 75 ft·lbf (102 N·m).
4. Re-install drive cover(s).

NOTE

On double reel headers, install screws (C) after both cover halves have been positioned.

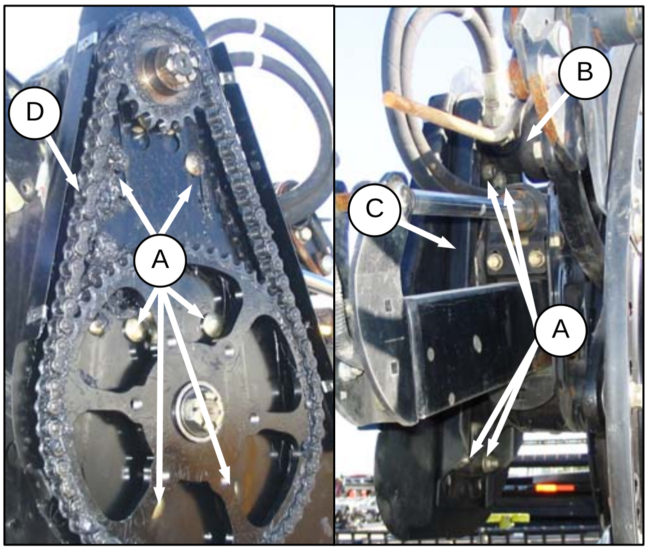
8.9.4.2 Replacing Drive Chain - D60 Single Reel

DANGER

To avoid bodily injury from fall of raised reel, always engage reel props before going under raised reel for any reason.

Removal

a. Remove reel drive cover. Refer to previous section.



b. Loosen bolts (A), and slide motor (B) and motor mount (C) down towards reel shaft.

c. Remove chain (D).

Installation

a. Position chain (D) around sprockets as shown opposite.

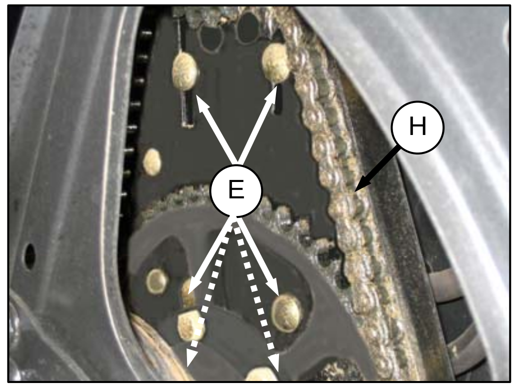
b. Slide the motor (B) and motor mount (C) until the tension on the chain (F) is such that hand force deflects the chain 1/8 inch (3 mm) at mid-span.

c. Tighten nuts (A), and re-check tension.

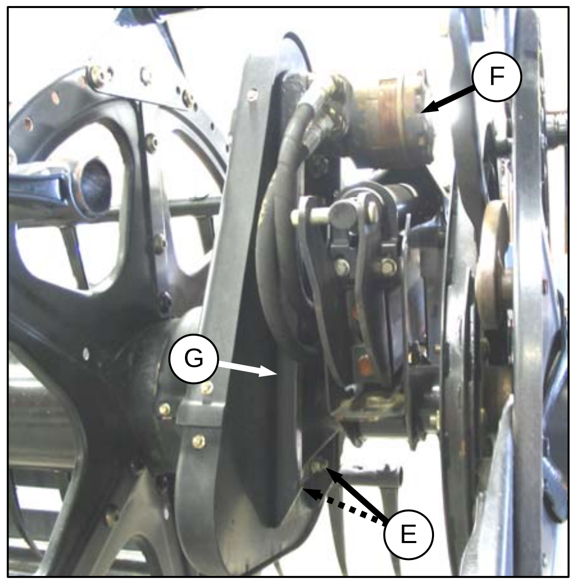
d. Re-install drive cover.

8.9.4.3 Drive Chain - D60 Double Reel

a. Remove reel drive cover. Refer to previous section.



b. Loosen six bolts (E).



c. Slide motor (F) and motor mount (G) down towards reel shaft to loosen chain (H).

The endless chain (H) can be replaced by:

Method 1: Disconnecting The Reel Drive (see 8.9.4.3.1).

OR

Method 2: Breaking The Chain, and installing a new chain with a connector link (see 8.9.4.3.2).

Method 1 is preferred because the chain integrity is not affected.

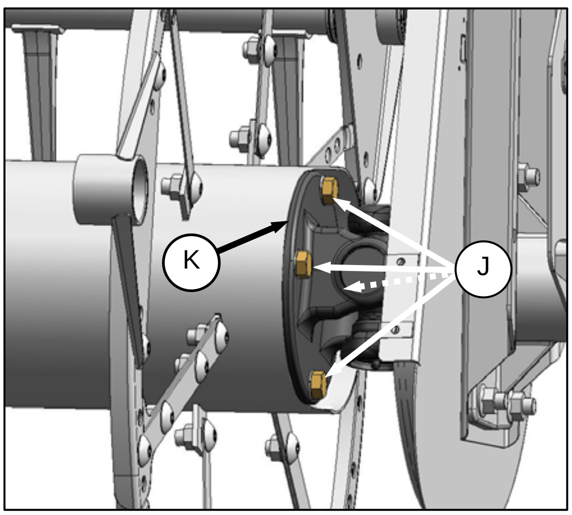
(continued next page)

8.9.4.3.1 *Disconnecting the Reel Drive (Method 1):*

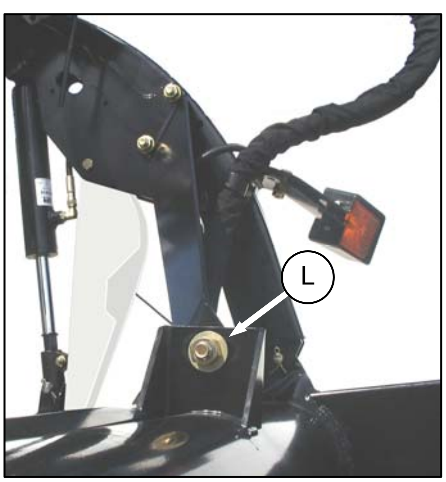


a. Support inboard end of right reel with a front end loader and nylon slings (or equivalent set-up).

IMPORTANT
To avoid damaging or denting center tube, support reel as close as possible to the end disc.



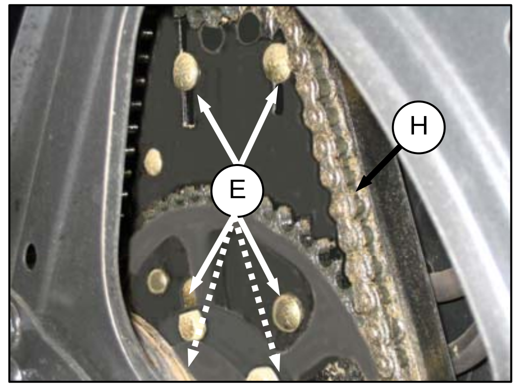
b. Remove four bolts (J) attaching reel tube to U-joint (K).



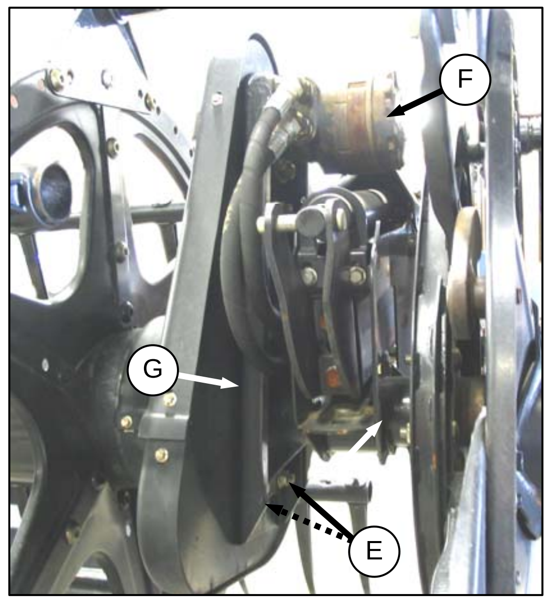
c. Loosen the RH reel arm brace by loosening bolt (L) on back-tube.

d. Move RH reel “sideways” to separate the reel tube and the U-Joint (K).

e. Remove the chain.



f. Route new chain (H) over U-Joint (K), and locate on sprockets.



g. Slide the motor (F) and motor mount (G) until the tension on the chain (H) is such that hand force deflects the chain 1/8 inch (3 mm) at mid-span.

h. Tighten nuts (E) and re-check tension.

i. Position RH reel tube against reel drive, and engage stub shaft into U-joint (K) pilot hole.

j. Rotate reel until holes in end of reel tube and U-joint line up.

k. Apply Loctite® #243 (or equivalent) to four ½” bolts (J), and install with lock-washers.

l. Torque to 75 - 85 ft·lbf (102 - 115 N·m).

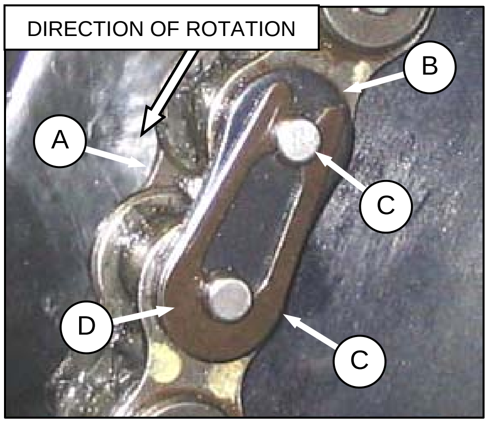
m. Remove temporary reel support.

n. Re-tighten reel arm brace bolt (L), and torque to 270 ft·lbf (366 N·m).

8.9.4.3.2 Breaking the Chain (Method 2):

a. Grind off the head from one of the link rivets, and punch out the rivet to separate the chain.

b. Locate ends of chain on sprocket.



c. Install pin connector (A) (not available as a MacDon part) into chain, preferably from the sprocket backside.

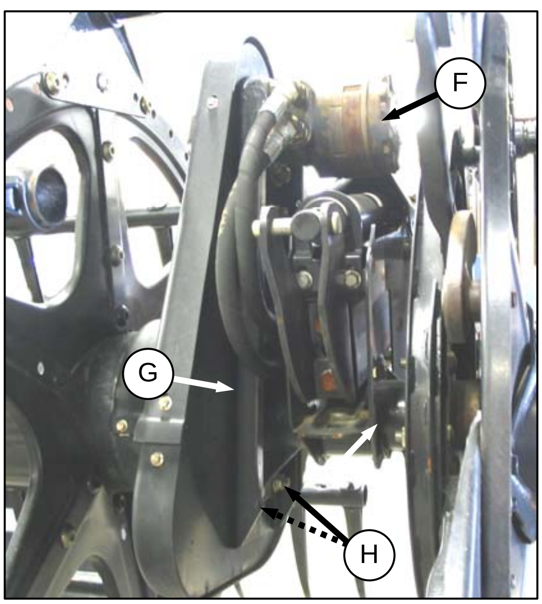
d. Install connector (B) onto pins.

e. Install spring clip (C) onto front pin (D) with closed end of clip in direction of sprocket rotation.

f. Locate one leg of clip in groove of aft pin (E).

g. Press other leg of spring clip over face of aft pin (E) until it slips into groove. Do **not** press clip lengthwise from closed end.

h. Ensure clip is seated in grooves of pins.



i. Slide the motor (F) and motor mount (G) until the tension on the chain is such that hand force deflects the chain 1/8 inch (3 mm) at mid-span.

j. Tighten nuts (H), and re-check tension.

k. Re-install drive covers.

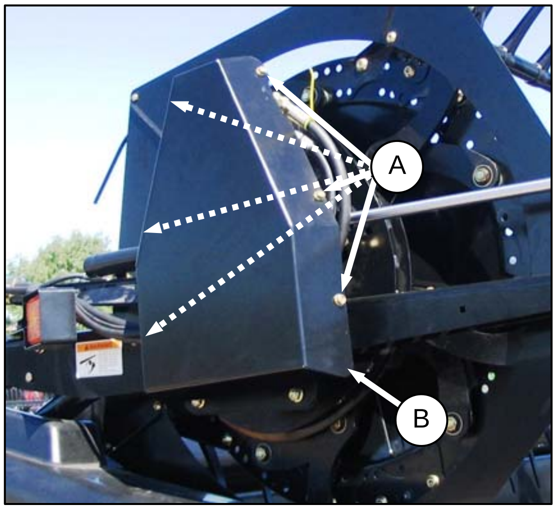
8.9.5 REEL DRIVE CHAIN - D50

8.9.5.1 Tension Adjustment

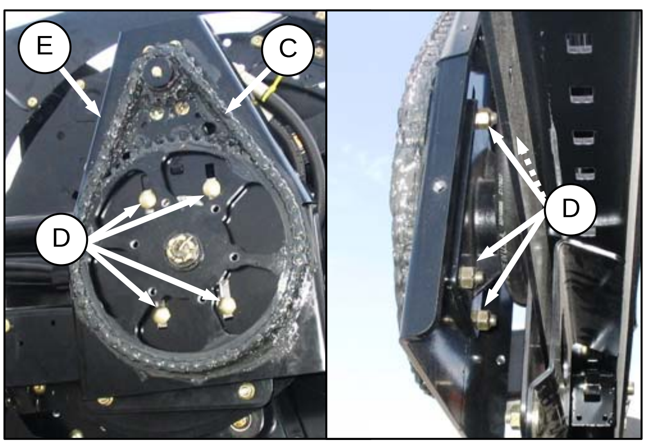
DANGER

To avoid bodily injury from fall of raised reel, always engage reel props before going under raised reel for any reason.

a. Lower header, raise reel, and engage reel props.



b. Remove six screws (A), and remove cover (B).



c. The tension on the chain (C) should be such that hand force deflects the chain 1/8 inch (3 mm) at mid-span.

d. To adjust the tension, loosen four bolts (D).

e. Slide the motor and motor mount (E) until the required tension is achieved.

f. Tighten bolts (D) to 75 ft·lbf (102 N·m).

g. Re-install drive cover.

8.9.5.2 Removal - Drive Chain

DANGER

To avoid bodily injury from fall of raised reel, always engage reel props before going under raised reel for any reason.

a. Remove reel drive cover. Refer to previous section.

b. Loosen drive chain (C) by loosening bolts (D), and sliding motor and motor mount (E) down towards reel shaft.

c. Remove chain.

8.9.5.3 Installation - Drive Chain

a. Position chain (C) around sprockets as shown.

b. Slide the motor and motor mount (E) until the tension on the chain (F) is such that hand force deflects the chain 1/8 in. (3 mm) at mid-span.

c. Tighten nuts (D), and re-check tension.

d. Re-install drive cover.

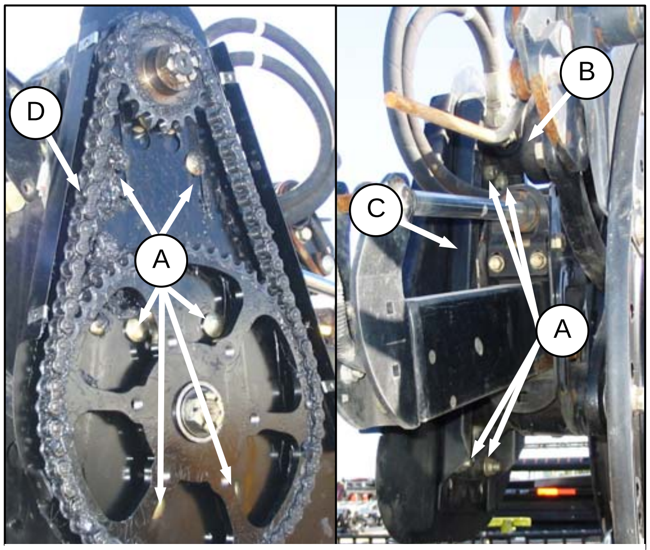
8.9.6 REEL DRIVE SPROCKET - D60

CAUTION

To avoid bodily injury from fall of raised reel, always engage reel props before going under raised reel for any reason.

8.9.6.1 Removal - Drive Sprocket

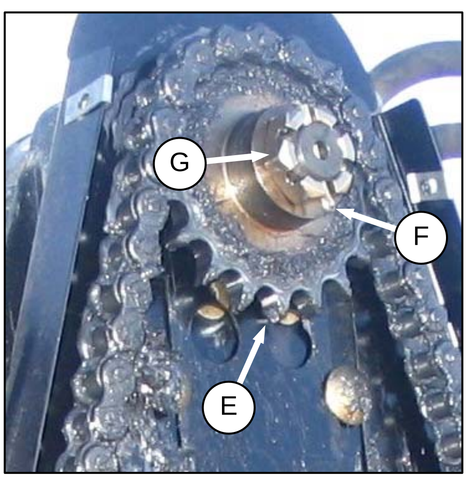
a. Remove reel drive cover(s). Refer to Section 8.9.4 Reel Drive Chain - D60.



SINGLE REEL SHOWN - DOUBLE REEL SIMILAR

b. Loosen six bolts (A) on motor mount.

c. Slide the motor (B) and motor mount (C) “downward” until chain (D) is loose.



d. Slip chain off drive sprocket (E).

e. Remove cotter pin (F) and slotted nut (G).

f. Remove sprocket (E).

IMPORTANT

Do not use pry bars and/or hammer to remove sprocket. This will damage the motor. Use a puller if sprocket does not come off by hand.

8.9.6.2 Installation - Drive Sprocket

Refer to illustrations opposite.

a. Align keyway in sprocket (E) with key in shaft, and slide new sprocket onto shaft.

b. Install slotted nut (G), and torque to 10 - 20 in·lbf (1.1 - 2.2 N·m).

c. Install cotter pin (F). Tighten nut to next slot if required.

d. Slip chain (D) over drive sprocket and tighten chain.

e. Slide the motor (B) and motor mount (C) until the required tension is achieved. The tension on the chain (D) should be such that hand force deflects the chain 1/8 inch (3 mm) at mid-span.

f. Tighten bolts (A) to 75 ft·lbf (102 N·m).

g. Re-install drive cover(s). Refer to Section 8.9.4 Reel Drive Chain - D60.

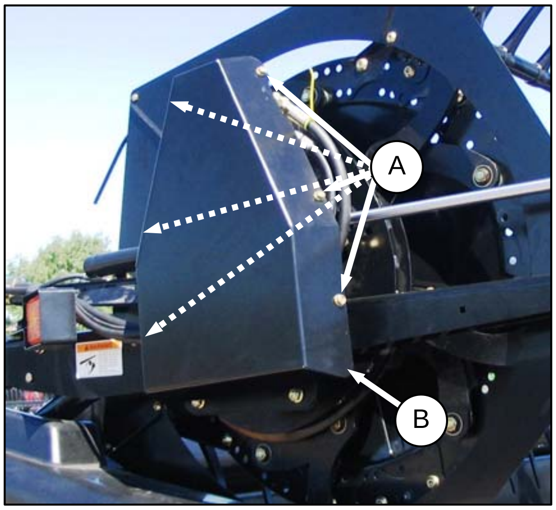
8.9.7 REEL DRIVE SPROCKET - D50

CAUTION

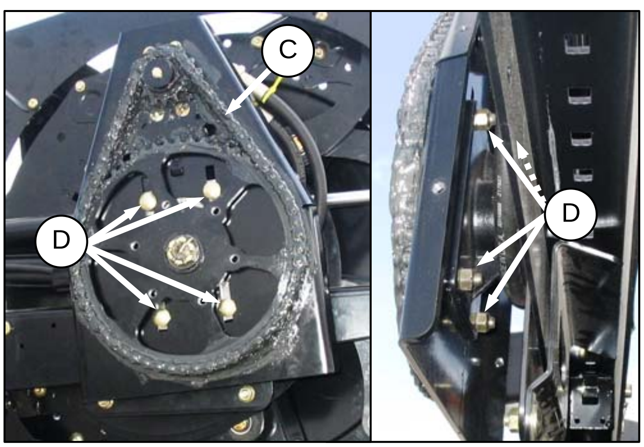
To avoid bodily injury from fall of raised reel, always engage reel props before going under raised reel for any reason.

8.9.7.1 Removal - Drive Sprocket

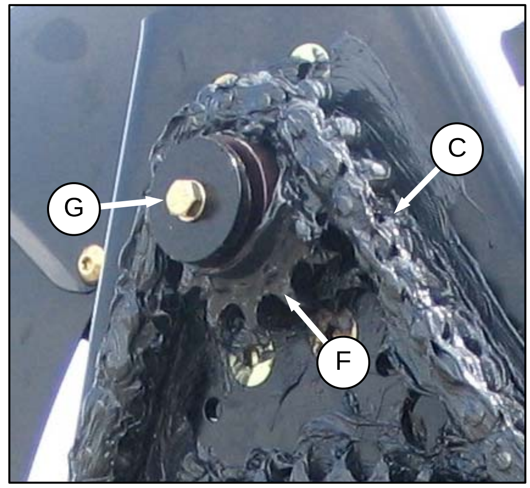
a. Lower header, raise reel, and engage reel props.



b. Remove six screws (A), and remove cover (B).



c. Loosen drive chain (C) by loosening bolts (D), and sliding motor and motor mount (E) down towards reel shaft.



d. Slip chain (C) off drive sprocket (F).

e. Remove bolt (G), lock-washer, and flat washer.

f. Remove sprocket (F).

IMPORTANT

Do not use pry bars and/or hammer to remove sprocket. This will damage the motor. Use a puller if sprocket does not come off by hand.

8.9.7.2 Installation - Drive Sprocket

Refer to illustrations above and opposite.

a. Align keyway in sprocket with key in shaft, and slide new sprocket onto shaft as shown.

b. Install bolt (G), flat washer, and lock-washer. Torque to 18 ft·lbf (24 N·m).

c. Slip chain (C) over drive sprocket, and tighten chain.

d. Slide the motor and motor mount (E) until the required tension is achieved. The tension on the chain (C) should be such that hand force deflects the chain 1/8 inch (3 mm) at mid-span.

e. Tighten bolts (D) to 75 ft·lbf (102 N·m).

f. Re-install drive cover.

8.9.8 REEL DRIVE U-JOINT - D60

CAUTION

To avoid bodily injury from fall of raised reel, always engage reel props before going under raised reel for any reason.

8.9.8.1 Removal - U-Joint

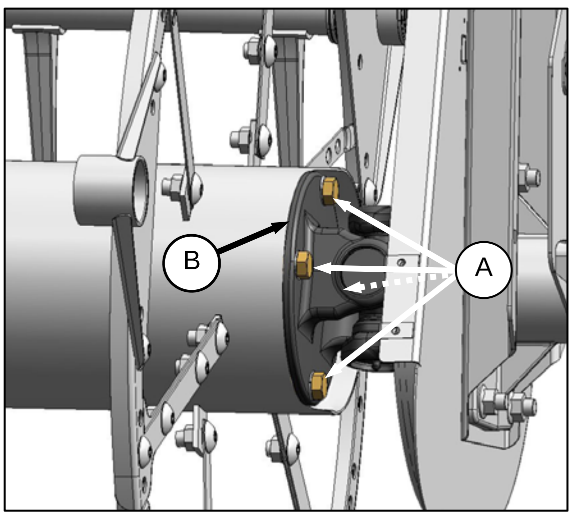
a. Lower header, raise reel, and engage reel props.

b. Remove reel drive cover. Refer to Section 8.9.4 Reel Drive Chain - D60.

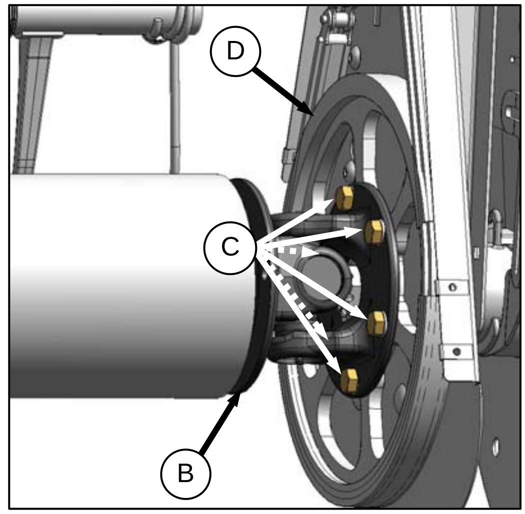
c. Support inboard end of right reel with a front end loader and nylon slings (or equivalent set-up).

IMPORTANT

To avoid damaging or denting center tube, support reel as close as possible to the end disc.



d. Remove four bolts (A) attaching reel tube to U-joint (B).



e. Remove six bolts (C) attaching U-joint (B) to driven sprocket (D).

f. Remove U-joint.

NOTE

Right hand reel may need to be moved sideways for U-joint to clear reel tube.

8.9.8.2 Installation - U-Joint

a. Position U-joint (B) onto driven sprocket (D) as shown, and install six bolts (C), and tighten. Do not torque at this time.

b. Position RH reel tube against reel drive, and engage stub shaft into U-joint pilot hole.

c. Rotate reel until holes in end of reel tube and U-joint line up.

d. Install four bolts (A), and torque to 70 - 80 ft·lbf (95 - 108 N·m).

e. Torque bolts (C) to 70 - 80 ft·lbf (95 - 108 N·m).

f. Remove temporary reel support.

g. Re-attach reel drive cover. Refer to Section 8.9.4 Reel Drive Chain - D60.

8.9.9 REEL DRIVE MOTOR - D60

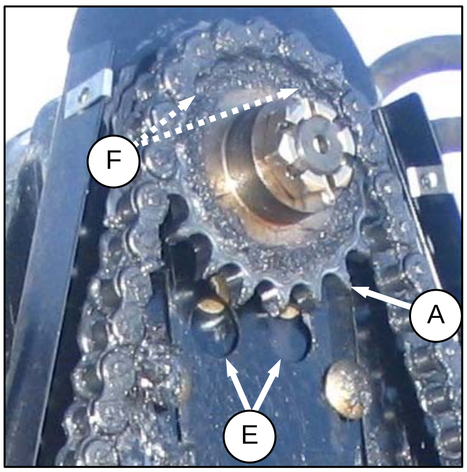
DANGER

To avoid bodily injury from fall of raised reel, always engage reel props before going under raised reel for any reason.

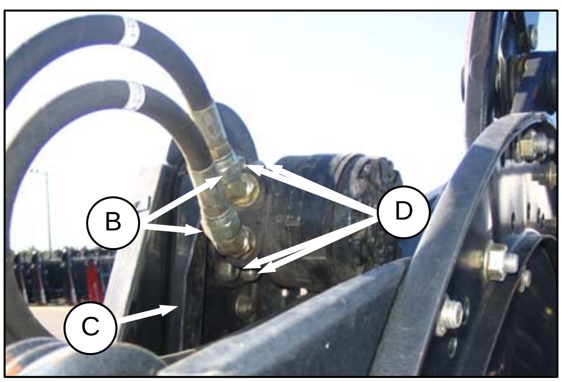
8.9.9.1 Removal - Drive Motor

a. Lower header, raise reel, and engage reel props.

b. Remove reel drive cover. Refer to Section 8.9.4 Reel Drive Chain - D60.



c. Loosen chain, and remove drive sprocket (A). Refer to Section 8.9.6 Reel Drive Sprocket - D60.



d. Disconnect hydraulic lines (B) at motor. Cap or plug open ports and lines.

e. Slide motor mount (C) so that attachment bolts (D) are exposed in holes (E) and slots (F) in back plate.

f. Remove four nuts and bolts (D), and remove motor.

8.9.9.2 Installation - Drive Motor

Refer to illustrations opposite.

a. Position hydraulic motor on motor mount (C), and install four countersunk bolts (D) through holes (E) and slots (F) in chain case into mount. Torque to 75 ft·lbf (102 N·m).

b. Re-attach hydraulic lines (B) to motor.

c. Install sprocket (A) onto motor shaft and install chain. Refer to Section 8.9.6 Reel Drive Sprocket - D60.

d. Re-attach reel drive cover. Refer to Section 8.9.4 Reel Drive Chain - D60.

8.9.10 REEL DRIVE MOTOR - D50

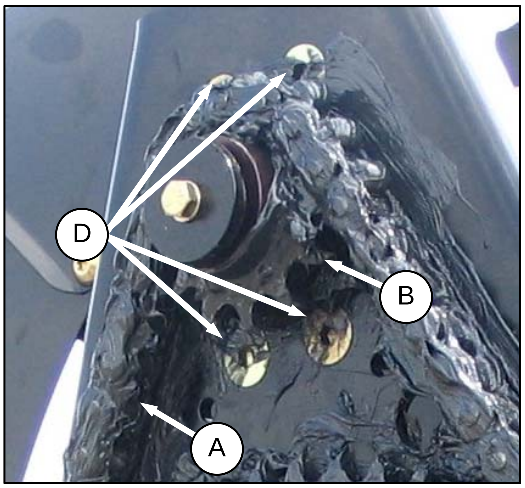
DANGER

To avoid bodily injury from fall of raised reel, always engage reel props before going under raised reel for any reason.

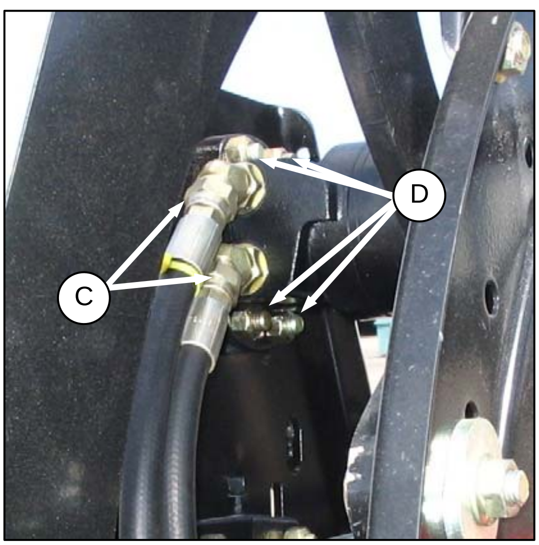
8.9.10.1 Removal - Drive Motor

a. Lower header, raise reel, and engage reel props.

b. Remove reel drive cover. Refer to Section 8.9.5 Reel Drive Chain - D50.



c. Loosen chain (A), and remove drive sprocket (B). Refer to Section 8.9.7 Reel Drive Sprocket - D50.



d. Disconnect hydraulic lines (C) at motor fittings. Cap or plug open ports and lines.

e. Remove the four nuts and bolts (D), and remove motor.

8.9.10.2 Installation - Drive Motor

Refer to illustrations opposite.

a. Position hydraulic motor on motor mount, and install four countersunk bolts (D). Torque to 75 ft·lbf (102 N·m).

b. Re-attach hydraulic lines (C) to motor.

c. Install sprocket (B) and chain (A). Refer to Section 8.9.7 Reel Drive Sprocket - D50.

d. Re-attach reel drive cover. Refer to Section 8.9.5 Reel Drive Chain - D50.

8.9.11 REEL SPEED SENSOR

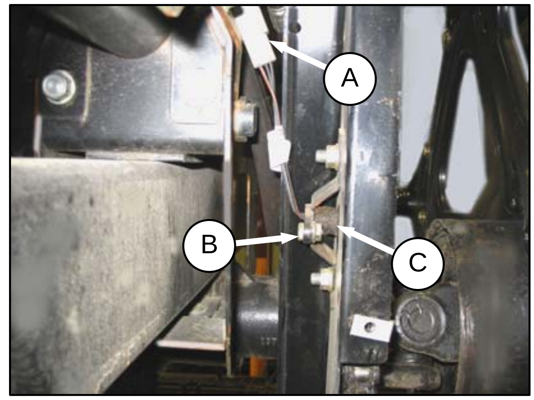
CAUTION

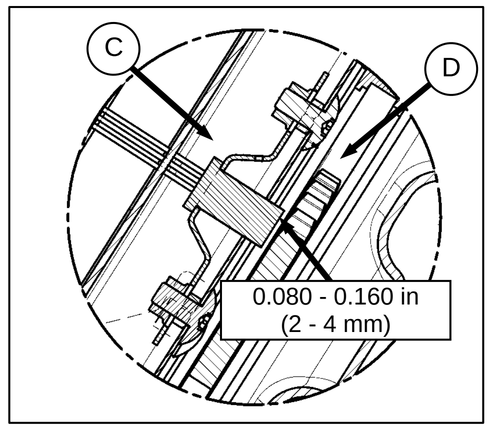
To avoid bodily injury from fall of raised reel, always engage reel props before going under raised reel for any reason.

WARNING

Stop engine, and remove key before making adjustments to machine. A child or even a pet could engage the drive.

To adjust and replace the self-propelled windrower reel speed sensor, proceed as follows:





a. Removal
   1. Disconnect sender wire (A).
   2. Remove nut and bolt (B) attaching sender to support.
   3. Remove sender (C).
b. Installation
   1. Position sender (C) on support, and install bolt (B) and nut.
   2. Connect sender wire at (A).
   3. Adjust clearance between sensor and driven sprocket (D) to 0.080 - 0.160 in. (2 - 4 mm) by bending support.

8.9.12 REEL TINES

IMPORTANT

Keep reel tines in good condition. Straighten or replace as required.

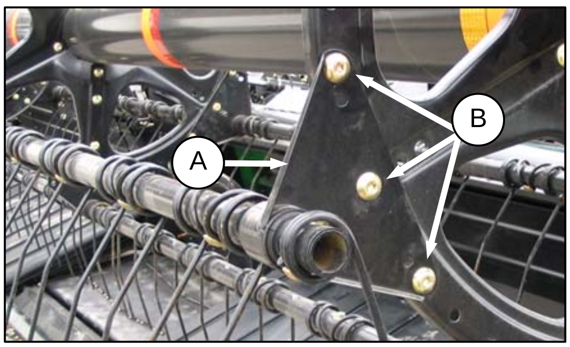
8.9.12.1 Removal - Steel Tines

CAUTION

To avoid bodily injury from fall of raised reel, always engage reel props before going under raised reel for any reason.

a. Lower header, raise reel, and engage reel props.

b. Remove the tine tube bushings from the applicable tine tube at the center and left discs. Refer to Section 8.9.13 Tine Tube Bushings.



c. Temporarily attach reel arms (A) to the reel disc, using the original attachment locations (B).

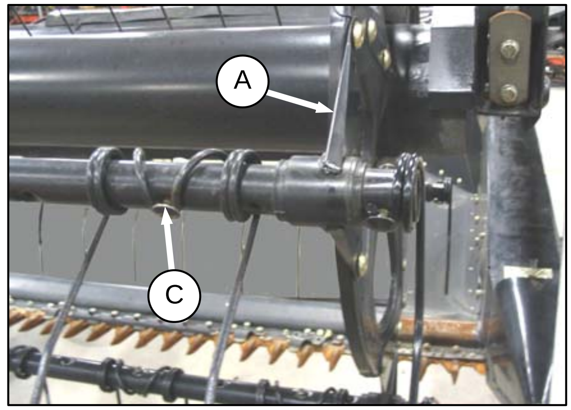
d. Cut the damaged tine(s) so that it can be removed from tube.

e. Remove bolts on existing tines, and slide tines over to replace the tine that was cut off in previous step. Remove reel arms (A) from tube as required.

8.9.12.2 Installation - Steel Tines

IMPORTANT

Ensure tine tube is supported at all times to prevent damage to the tube or other components.

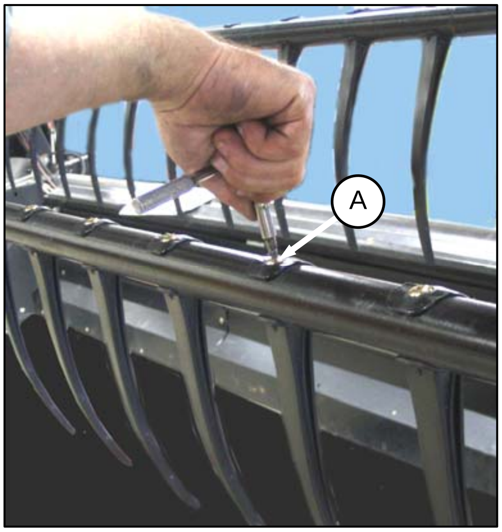


a. Slide new tines and reel arms (A) onto end of tube.

b. Install tine tube bushings. Refer to Section 8.9.13 Tine Tube Bushings.

c. Attach tines to tine bar with bolts and nuts (C).

8.9.12.3 Removal - Plastic Fingers



a. Remove screw (A) with TORX-Plus 27 IP socket wrench.



REMOVAL

b. Push finger top clip back toward reel tube, and remove from finger tube.

8.9.12.4 Installation - Plastic Fingers



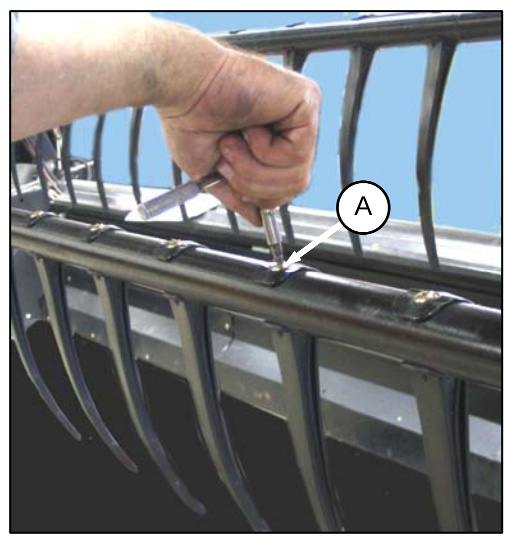
INSTALLATION

a. Position finger on rear of finger tube, and engage lug at bottom of finger in lower hole in finger tube.
b. Gently lift top flange, and rotate finger until lug in top flange engages upper hole in finger tube.

IMPORTANT

Do not apply force to finger prior to tightening mounting screw.

Applying force to finger without screw tightened will break finger or shear off locating pins.



c. Install screw (A), and torque to 75 - 80 in·lbf (8.5 - 9.0 N·m) with a TORX-Plus 27 IP socket wrench.

8.9.13 TINE TUBE BUSHINGS

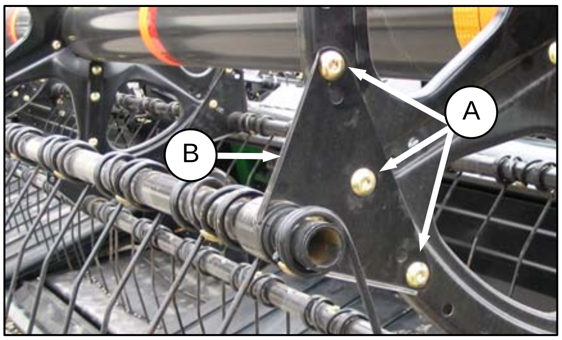
CAUTION

To avoid bodily injury from fall of raised reel, always engage reel props before going under raised reel for any reason.

Lower header, raise reel fully, and engage reel stops.

8.9.13.1 Bushing Removal - 6 and 9 Bat Pick-Up Reels

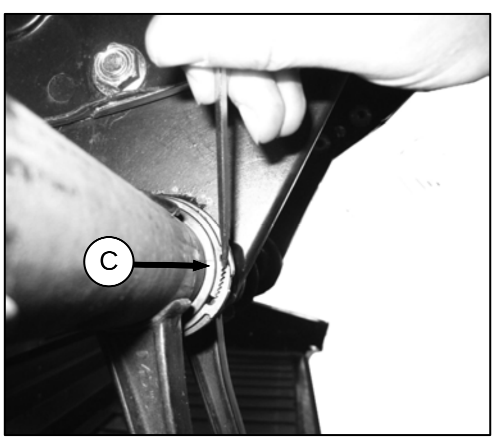
a. Remove bushings at center disc, and left end disc as follows:



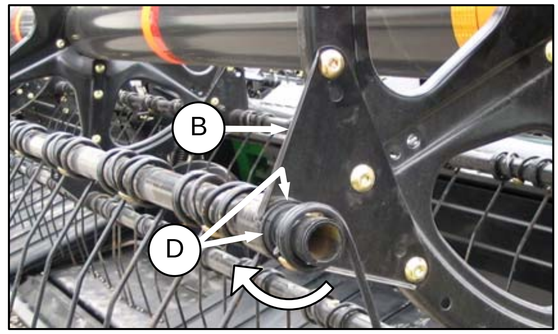
1. Remove bolts (A) securing arm (B) to disc at both locations.

IMPORTANT
Ensure tine tube is supported at all times to prevent damage to the tube or other components.

IMPORTANT
Note the hole locations in arm and disc, and ensure bolts are re-installed at original locations.

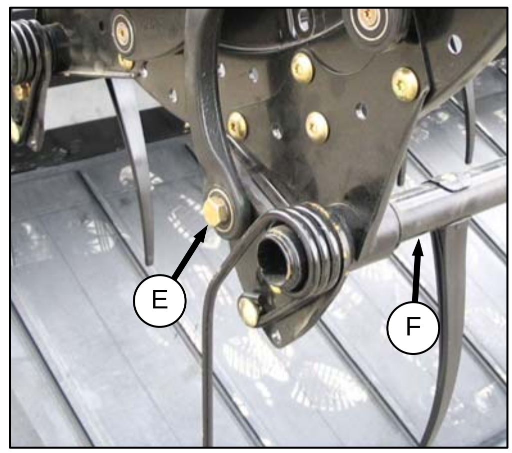


2. Release bushing clamps (C) using a small screwdriver to separate the serrations. Pull clamp off tine tube.

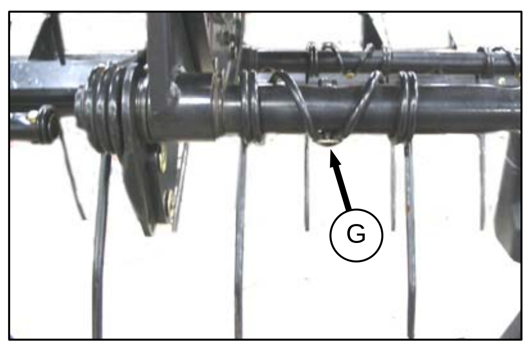


3. Rotate arm (B) clear of disc, and slide arm inboard off bushing, and remove bushing halves (D). Remove bolt from tine next to arm (or remove plastic finger) if required so that arm can slide off bushing.

b. Remove cam end bushings as follows:

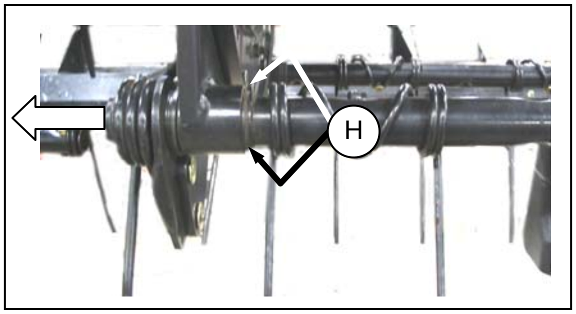


1. Remove bolt (E) at on cam linkage so that tine tube (F) is free to rotate.



2. If required, remove bolt (G) securing the <u>first</u> tine to the left of the support, so that tine is free to move inboard (to the right). If plastic finger is installed, refer to previous section for removal procedure.

(continued next page)

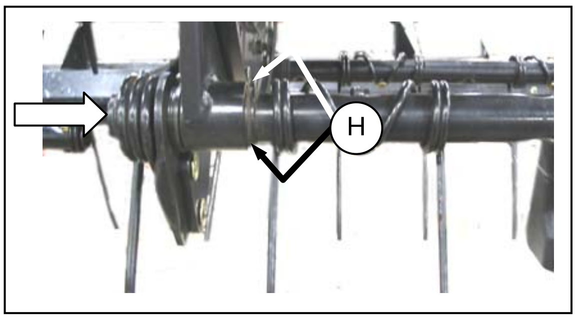


3. Slide tine tube to expose bushing. Remove bushing halves (H).

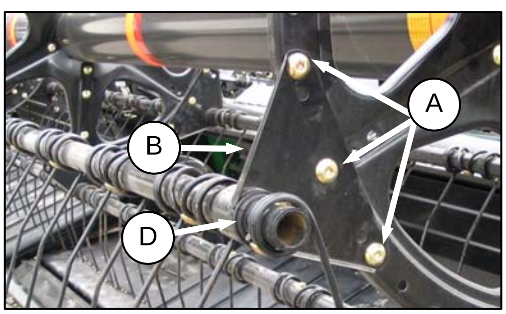
8.9.13.2 Bushing Installation - 6 and 9 Bat Pick-Up Reels

IMPORTANT

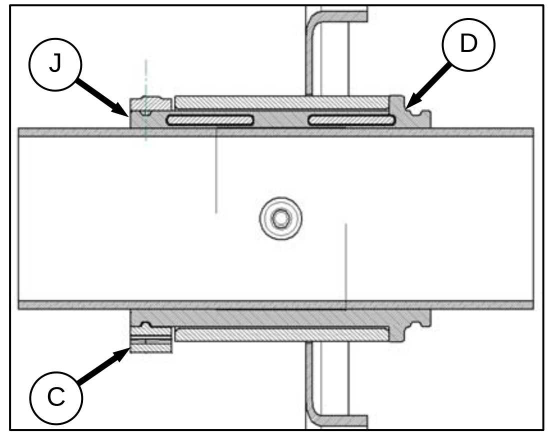
Ensure tine tube is supported at all times to prevent damage to the tube or other components.



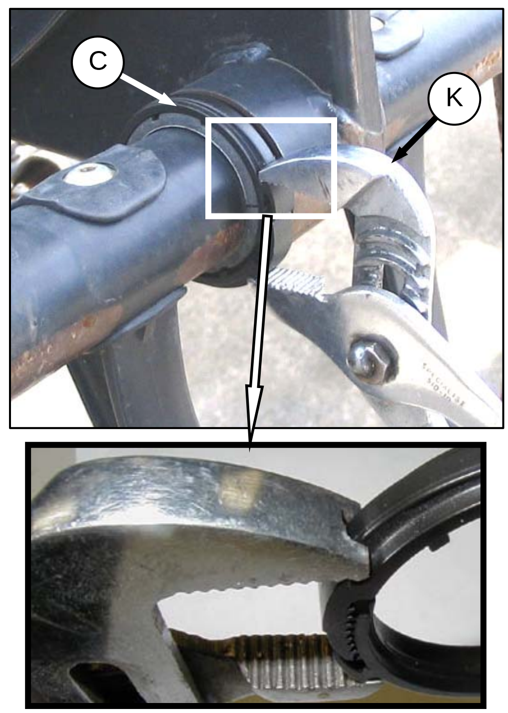
a. At cam end, position bushing halves (H) on tine tube so that lug in each bushing half locates in hole in tine tube.
b. Slide tine tube to the left side of header to locate bushings in reel arm.



c. At the center and left side disc, position bushing halves (D) on tine tube so that lug in each bushing half locates in hole in tine tube.
d. Slide reel arm (B) onto bushing, and position against disc at original location.
e. Install bolts (A) in original holes, and tighten.
f. Re-install any fingers or tines that were removed.
g. Install bushing clamps as follows:



1. Spread clamp (C), and slip over tine tube adjacent to flangeless end (J) of bushing.
2. Locate clamp on bushings (D) so that edges of clamp and bushing are flush when clamp fits into groove on bushing, and lock tabs are engaged.



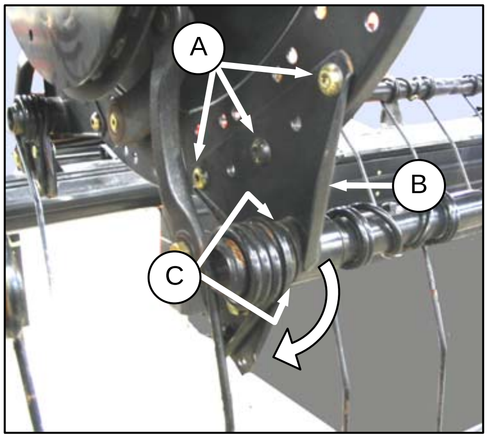
3. Tighten clamp with modified channel lock pliers (K), so that finger pressure will not move clamp.

IMPORTANT

Over tightening clamp may result in breakage.

8.9.13.3 Bushing Removal - 5 Bat Pick-Up Reels

a. Remove bushings at cam end disc as follows:



1. Remove bolts (A) securing arm (B) to disc.

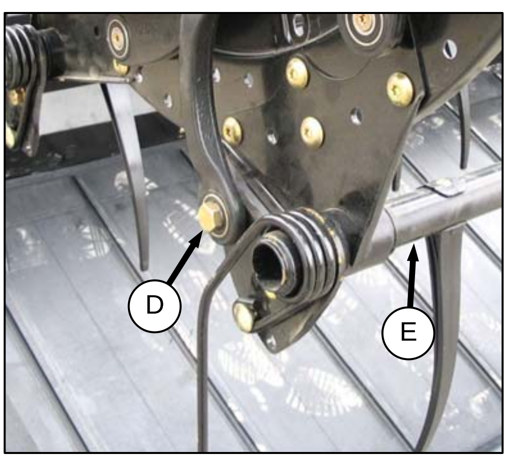
IMPORTANT
Ensure tine tube is supported at all times to prevent damage to the tube or other components.

IMPORTANT
Note the hole locations in arm and disc, and ensure bolts are re-installed at original locations.

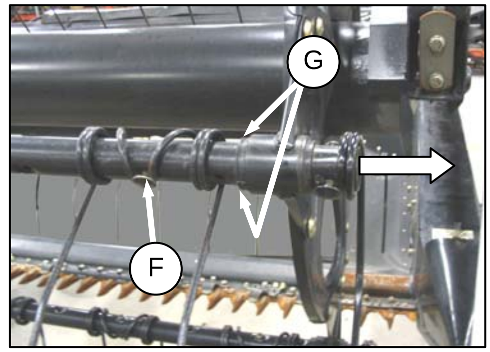
2. Remove bushing clamp as previously described.
3. Rotate arm (B) clear of disc, and slide arm off bushing. Remove bolt from tine next to arm (or remove plastic finger) if required so that arm can slide off bushing.
4. Remove bushing halves (C).

b. Remove bushings at center disc and left end disc as follows:

1. Disconnect reel arm at cam end so that tine tube is free to move. See step a.1.



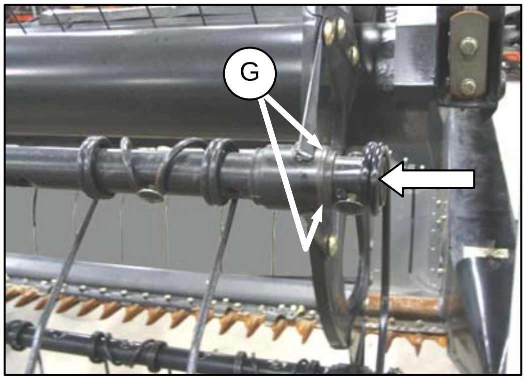
2. Remove bolt (D) at on cam linkage so that tine tube (E) is free to rotate.



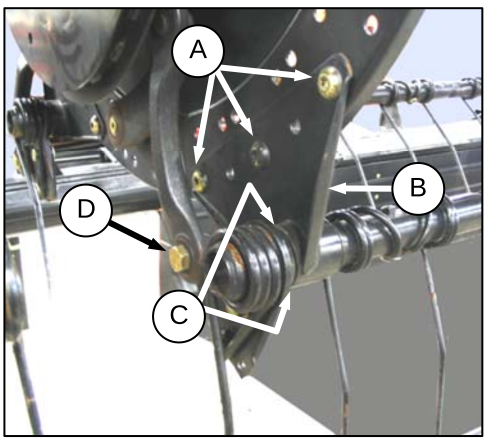
3. Slide tine tube outboard to expose bushings. Remove bolt (F) from tine (or remove plastic finger) next to arm if required so that tube can slide through arm.
4. Remove bushing halves (G).

(continued next page)

8.9.13.4 Bushing Installation - 5 Bat Pick-Up Reels



a. At center disc and left end disc, position bushing halves (G) on tine tube so that lug in each bushing half locates in hole in tine tube.
b. Slide tine tube inboard (towards cam end) to locate bushing in reel arm.



c. At the cam end disc, position bushing halves (C) on tine tube so that lug in each bushing "half locates" in hole in tine tube.
d. Slide reel arm (B) onto bushing, and position against disc at original location.
e. Install bolts (A) in original holes, and tighten.
f. Re-install any fingers or tines that were removed.
g. Re-install bolt (D) at on cam linkage.
h. Install bushing clamps as previously described.

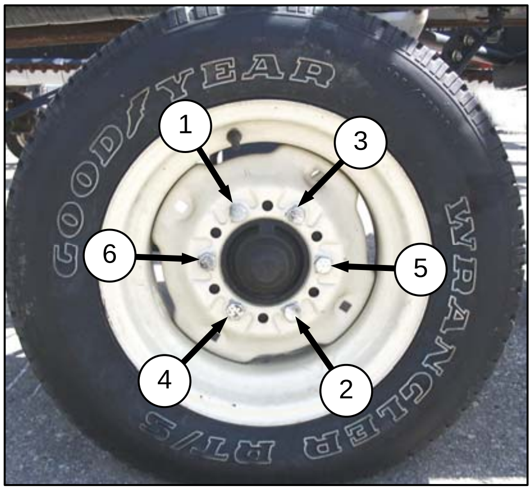
8.10 TRANSPORT SYSTEM

Optional equipment on 30, 35, and 40 FT. headers.

8.10.1 WHEEL BOLT TORQUE

IMPORTANT

Whenever a wheel is removed and re-installed, check torque after one hour of operation. Maintain 80 - 90 ft·lbf (110 - 120 N·m) torque.



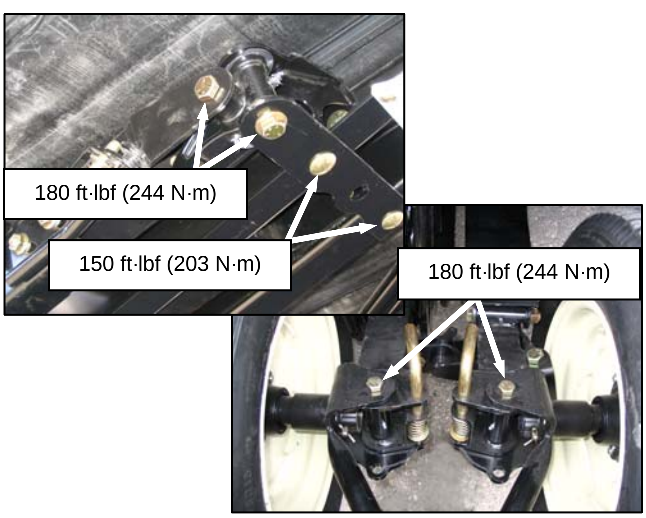
a. Check and tighten wheel bolts after the first hour of operation, and every 100 hours thereafter. Maintain 80 - 90 ft·lbf (110 - 120 N·m) torque.

IMPORTANT

Follow proper bolt tightening sequence shown above.

8.10.2 AXLE BOLTS

a. Check and tighten axle bolts daily until torque is maintained as shown.



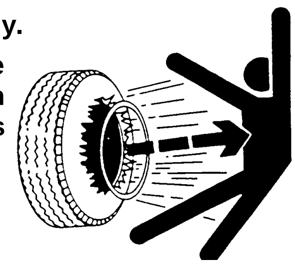
8.10.3 TIRE INFLATION

Check tire pressure daily. Maintain pressures recommended in following table:

YEAR	TIRE	SIZE	PRESSURE
2006 and EARLIER	GOODYEAR WRANGLER RT/S	205-75 R15	40 psi (276 kPa)
2007 to 2009	CARLISLE and TITAN	ST205/75 R15	65 psi (448 kPa)
2010 and LATER	DICO	ST205/75 R15	LR “D” 65 psi (448 kPa)
			LR “E” 80 psi (552 kPa)

WARNING

- **Service tires safely.**
- **A tire can explode during inflation and cause serious injury or death.**



- **Do not stand over tire. Use a clip-on chuck and extension hose.**
- **Never increase air pressure beyond pressure specified on tire side wall to seat the bead on the rim.**
- **Replace the tire if it has a defect.**
- **Replace a wheel rim that has cracks, wear or severe rust.**
- **Never weld a wheel rim.**
- **Never use force on an inflated or partially inflated tire.**
- **Make sure the tire is correctly seated before inflating to operating pressure.**
- **If the tire is not in correct position on the rim, or is too full of air, the tire bead can loosen on one side, causing air to leak at high speed and with great force. An air leak of this nature can thrust the tire in any direction, endangering anyone in the area.**
- **Make sure all the air is removed from a tire before removing the tire from a rim.**
- **Do not remove, install or make repairs to a tire on a rim unless you have the proper equipment and experience to perform the job.**
- **Take the tire and rim to a qualified tire repair shop.**

8.11 MAINTENANCE SCHEDULE

The following maintenance schedule is a listing of periodic maintenance procedures, organized by service intervals. Regular maintenance is the best insurance against early wear and untimely breakdowns. Following this schedule will increase machine life.

For detailed instructions, refer to the specific headings in Section 8 MAINTENANCE AND SERVICING. Use the fluids and lubricants specified in Section 8.3.4 Recommended Fluids and Lubricants.

Service Intervals: The recommended service intervals are in hours of operation. Where a service interval is given in more than one time frame, e.g. "100 hours or Annually", service the machine at whichever interval is reached first.

IMPORTANT

Recommended intervals are for average conditions. Service the machine more often if operated under adverse conditions (severe dust, extra heavy loads, etc.).

CAUTION

Carefully follow safety messages given under Section 8.1 PREPARATION FOR SERVICING, and Section 8.2 RECOMMENDED SAFETY PROCEDURES.

8.11.1 BREAK-IN INSPECTIONS

BREAK-IN INSPECTIONS		
HOURS	**ITEM**	**CHECK**
5	Hardware	Torque. Refer to Section 8.3.1 Recommended Torques.
	Sickle Drive Belts.	Tension. Refer to Section Refer to Section 8.7.8 Sickle Drive Belts - Non-Timed Drive and 8.7.9 Sickle Drive Belts - Timed Drive. Periodically check for first 50 hours.
10	Wobble Box Mounting Bolts	Torque. Refer to Section 8.7.10.1 Mounting Bolts.
50	Wobble Box Lubricant.	Change. Refer to 8.7.10.6 Changing Oil.

8.11.2 INTERVAL MAINTENANCE

INTERVAL	***SERVICE***	
FIRST USE	Refer To Section 8.11.1 BREAK-IN INSPECTIONS (previous page).	
100 HOURS OR ANNUALLY *	1. Check Wobble Box Mounting Bolts. 2. Check Wobble Box Lubricant Level. 3. Check Sickle Drive Belt Tension. 4. Check Transport Wheel Bolt Torque (Option). 5. Check Reel Tine To Cutterbar Clearance.	6. Check Reel Drive Chain Tension. 7. Grease Reel Drive Chain. 8. Grease Upper Cross Auger RH Support (Option). 9. Lubricate Hydraulic Couplers.
END OF SEASON	Refer To Section 7.22 STORAGE.	
10 HOURS OR DAILY	1. Check Hydraulic Hoses And Lines For Leaks. 2. Check Stabilizer/Transport Wheels Tire Pressure. 3. Check Sickle Sections, Guards, And Hold-Downs. 4. Oil Sickle (Except In Sandy Conditions).	
25 HOURS	1. Grease Sickle Head.	
50 HOURS	1. Grease Sickle Drive Shaft Bearings (Double Knife). 2. Grease Draper Roller Bearings.	
250 HOURS OR ANNUALLY *	1. Grease Transport Axle Pivot Bushings (Option). 2. Grease Split Reel U-Joint. 3. Grease Upper Cross Auger Center Support (30 FT. and Up - Option).	
500 HOURS OR ANNUALLY*	1. Grease Transport/Stabilizer Wheel Hub Bearings. 2. Grease Reel Shaft Bearings.	
1000 HOURS OR 3 YEARS	1. Change Wobble Box Lubricant.	

*** IT IS RECOMMENDED THAT ANNUAL MAINTENANCE BE DONE PRIOR TO START OF OPERATING SEASON.**

8.11.3 MAINTENANCE RECORD

ACTION: ✓ - Check | 💧 - Lubricate | ▲ - Change

MAINTENANCE RECORD	**Hour Meter Reading**																
	Date																
	Serviced By																
	FIRST USE	Refer To Section 8.11.1 Break-In Inspections.															
	100 HOURS OR ANNUALLY																
✓	Reel Drive Chain Tension																
✓	Reel Tine/Cutterbar Clearance																
✓	Sickle Drive Belt Tension																
✓	Wheel Bolt Torque																
✓	Wobble Box Lubricant Level																
✓	Wobble Box Mounting Bolts																
💧	Hydraulic Couplers																
💧	Reel Drive Chain																
💧	Upper Cross Auger RH Support																
	END OF SEASON	Refer To Section 7.22 STORAGE.															
	10 HOURS OR DAILY	**NOTE: A RECORD OF DAILY MAINTENANCE IS NOT NORMALLY REQUIRED BUT IS AT THE OWNER/OPERATOR'S DISCRETION.**															
✓	Hydraulic Hoses And Lines																
✓	Sickle Assembly																
✓	Tire Pressure																
💧	Sections, Guards, Hold-downs																
	25 HOURS																
💧	Sickle Head(s)																
	50 HOURS																
💧	Draper Roller Bearings																
💧	Sickle Drive Shaft Bearings (DK)																
▲	Wobble Box Oil - First 50 Hrs Only																
	250 HOURS OR ANNUALLY																
💧	Upper Cross Auger Center Support																
💧	Reel Drive U-Joint																
💧	Transport Axle Pivot Bushings																
	500 HOURS OR ANNUALLY																
💧	Reel Shaft Bearings																
💧	Stabilizer/Transport Wheel Bearings																
	1000 HOURS OR 3 YEARS																
▲	Wobble Box Lubricant																

9 TROUBLESHOOTING

9.1 CROP LOSS AT CUTTERBAR

SYMPTOM	PROBLEM	SOLUTION	SECTION
Does Not Pick-Up Down Crop.	Cutterbar too high.	Lower cutterbar.	7.12.1
	Header angle too flat.	Steepen header angle.	7.12.3
	Reel too high.	Lower reel.	7.12.8
	Reel too far back.	Move reel forward.	7.12.9
	Ground speed too fast for reel speed.	Reduce ground speed or increase reel speed.	7.12.5 7.12.4
	Reel fingers not lifting crop sufficiently.	Increase finger pitch aggressiveness.	7.12.10
		Install lifter guards.	*
Heads Shattering Or Breaking Off.	Reel speed too fast.	Reduce reel speed.	7.12.4
	Reel too low.	Raise reel.	7.12.8
	Ground speed too fast.	Reduce ground speed.	7.12.5
	Crop too ripe.	Operate at night when humidity is higher.	---
Cut Grain Falling Ahead Of Cutterbar.	Ground speed too slow.	Increase ground speed.	7.12.5
	Reel speed too slow.	Increase reel speed.	7.12.4
	Reel too high.	Lower reel.	7.12.8
	Cutterbar too high.	Lower cutterbar.	7.12.1
	Reel too far forward.	Move reel back on arms.	7.12.9
	Cutting at speeds over 6 mph (10 km/h) with high-torque (10 tooth) reel drive sprocket.	Replace with high speed (19 tooth) reel drive sprocket.	8.9.6 or 8.9.7
	Worn or broken sickle components.	Replace.	8.7
Strips Of Uncut Material.	Crowding uncut crop.	Allow enough room for crop to be fed to cutterbar.	---
	Broken sickle sections.	Replace.	8.7
Excessive Bouncing At Normal Field Speed.	Float set too light.	Adjust float.	7.12.2
Divider Rod Running Down Standing Crop.	Divider rods too long.	Remove divider rod.	7.12.11
Bushy or Tangled Crop Flows Over Divider Rod, Builds Up On Endsheets.	Divider rods providing insufficient separation.	Install long divider rods or floating dividers.	7.12.11

*** See your MacDon dealer.**
**** Refer to Windrower Operator's Manual.**
***** Refer to Windrower Technical Service Manual.**

SECTION 9. TROUBLESHOOTING

SYMPTOM	PROBLEM	SOLUTION	SECTION
Crop Not Being Cut At Ends.	Reel not "frowning" or not centered in header.	Adjust reel "frown" or reel horizontal position.	8.9.2 & 8.9.3
	Sickle hold-downs not adjusted properly.	Adjust hold-downs so sickle works freely, but still keep sections from lifting off guards.	8.7.7
	Sickle sections or guards are worn or broken.	Replace all worn and broken cutting parts.	8.7
	Header is not level.	Level header.	** & 7.18
	Reel fingers not lifting crop properly ahead of sickle.	Adjust reel position / finger pitch.	7.12.9 & 7.12.10
	Divider runs down thick crop at ends, preventing proper feeding due to material bridging the cutter guards.	Replace 3 or 4 end guards with stub guards.	* & 8.7.6 & 10.3
Crop Getting Stuffed In Gap Between Cutout in Endsheet and Knife Head.	Crop heads leaning away from knife head hole in endsheet.	Add knife head shield (s), except in damp/sticky soils.	10.13

9.2 CUTTING ACTION AND SICKLE COMPONENTS

SYMPTOM	PROBLEM	SOLUTION	SECTION
Ragged Or Uneven Cutting Of Crop.	Sickle hold-downs not adjusted properly.	Adjust hold-downs.	8.7.7
	Sickle sections or guards are worn or broken.	Replace all worn and broken cutting parts.	8.7
	Sickle is not operating at recommended speed.	Check engine speed of windrower.	**
	Ground speed too fast for reel speed.	Reduce ground speed or increase reel speed.	7.12.5 7.12.4
	Reel fingers not lifting crop properly ahead of sickle.	Adjust reel position / finger pitch.	7.12.9 & 7.12.10
	Cutterbar too high.	Lower cutting height.	7.12.1
	Header angle too flat.	Steepen header angle.	7.12.3
	Bent sickle, causing binding of cutting parts.	Straighten a bent sickle. Align guards.	8.7.6
	Cutting edge of guards not close enough or parallel to sickle sections.	Align guards.	8.7.6
	Tangled/tough to cut crop.	Install stub guards.	* & 8.7.6 & 10.3
	Reel too far back.	Move reel forward.	7.12.9

***   See your MacDon dealer.**
**** Refer to Windrower Operator’s Manual.**
***** Refer to Windrower Technical Service Manual.**

SYMPTOM	PROBLEM	SOLUTION	SECTION
Ragged Or Uneven Cutting Of Crop (Continued).	Loose sickle drive belt.	Adjust drive belt tension.	8.7.8 & 8.7.9
Sickle Plugging.	Reel too high or too far forward.	Lower reel or move reel rearward.	7.12.8 & 7.12.9
	Ground speed too slow.	Increase ground speed.	7.12.5
	Loose sickle drive belt.	Adjust drive belt tension.	8.7.8 & 8.7.9
	Improper sickle hold-down adjustment.	Adjust hold-down.	8.7.7
	Dull or broken sickle sections.	Replace sickle section.	8.7.1
	Bent or broken guards.	Align or replace guards.	8.7.6
	Reel fingers not lifting crop properly ahead of sickle.	Adjust reel position / finger pitch.	7.12.9 & 7.12.10
	Steel pick-up fingers contacting sickle.	Increase reel clearance to cutterbar, or adjust "frown".	8.9.1 & 8.9.2
	Float too heavy.	Adjust springs for lighter float.	7.12.2
	Mud or dirt build-up on cutterbar.	Raise cutterbar by lowering skid shoes.	7.12.1.2
		Install cut-out sections.	*
		Flatten header angle.	7.12.3
	Sickle is not operating at recommended speed.	Check engine speed of windrower.	**
Excessive Header Vibration.	Sickle hold-downs not adjusted properly.	Adjust hold-downs.	8.7.7
	Sickles on double knife drive not timed.	Adjust sickle timing.	8.7.9.3
	Sickle not operating at recommended speed.	Check engine speed of windrower.	**
	Excessive sickle wear.	Replace sickle.	8.7.2 & 8.7.4
	Loose or worn sickle head pin or drive arm.	Tighten or replace parts.	8.7.3 & 8.7.10
	Bent cutterbar.	Straighten cutterbar.	*
Sickle Back Breakage.	Bent or broken guard.	Straighten or replace.	8.7.6
	Worn sickle head pin.	Replace.	8.7.3
	Dull sickle.	Replace.	8.7.2 & 8.7.4

*** See your MacDon dealer.**
**** Refer to Windrower Operator's Manual.**
***** Refer to Windrower Technical Service Manual.**

SYMPTOM	PROBLEM	SOLUTION	SECTION
Excessive Breakage Of Sickle Sections Or Guards.	Sickle hold-downs not adjusted properly.	Adjust hold-downs.	8.7.7
	Cutterbar operating too low in stony conditions.	Raise cutterbar, using skid shoes.	7.12.1.2
	Float is set too heavy.	Adjust float springs for lighter float.	7.12.2
	Bent or broken guard.	Straighten or replace.	8.7.6
	Header angle too steep.	Flatten header angle.	7.12.3

9.3 REEL DELIVERY

SYMPTOM	PROBLEM	SOLUTION	SECTION
Reel Not Releasing Crop.	Reel speed too fast.	Reduce reel speed.	7.12.4
	Reel too low.	Raise reel.	7.12.8
	Reel tines too aggressive.	Reduce cam setting.	7.12.10
	Reel too far back.	Move reel forward.	7.12.9
Reel Not Releasing Material in Lodged and Standing Crop (Reel Fully Lowered).	Reel tines too aggressive for standing crop.	Reduce cam setting (set to 1 or 2).	7.12.10.3
Wrapping On Reel End.	Reel tines too aggressive.	Reduce cam setting.	7.12.10
	Reel too low.	Raise reel.	7.12.8
	Reel speed too fast.	Reduce reel speed.	7.12.4
	Crop conditions.	Install optional reel endshields.	10.9
	Reel not centered in header.	Center reel in header.	8.9.3
Reel Releases Crop Too Quickly.	Reel tines not aggressive enough.	Increase cam setting.	7.12.10
	Reel too far forward.	Move reel back.	7.12.9
Reel Will Not Lift.	Reel lift couplers are incompatible or defective.	Change quick coupler.	---
Reel Will Not Turn.	Control set at 0.	Activate reel speed control.	7.12.4
	Quick couplers not properly connected.	Connect couplers.	7.3.1
	Reel drive chain disconnected.	Connect chain.	8.9.4 & 8.9.5
Reel Motion Uneven Under No Load.	Excessive slack in reel drive chain.	Tighten chain.	

*** See your MacDon dealer.**
**** Refer to Windrower Operator's Manual.**
***** Refer to Windrower Technical Service Manual.**

SECTION 9. TROUBLESHOOTING

SYMPTOM	PROBLEM	SOLUTION	SECTION
Reel Motion Is Uneven Or Stalls In Heavy Crop.	Reel speed too fast.	Reduce reel speed.	7.12.4
	Reel fingers not aggressive enough.	Move to a more aggressive finger pitch notch.	7.12.10
	Reel too low.	Raise reel.	7.12.8
	Relief valve on windrower has low relief pressure setting.	Increase relief pressure to manufacturer's recommendations.	**
	Low oil reservoir level on windrower. (NOTE: Sometimes more than one reservoir.)	Fill to proper level.	
	Relief valve malfunction.	Replace relief valve.	
	Cutting tough crops with high-speed (19 tooth) reel drive sprocket.	Replace with high torque (10 tooth) or 14 tooth reel drive sprocket.	8.9.6 or 8.9.7
Plastic Fingers Cut At Tip. 	Insufficient reel to cutterbar clearance.	Increase clearance.	8.9.1
Plastic Fingers Bent Rearward At Tip. 	Reel digging into ground with reel speed slower than ground speed.	Raise header. Decrease header tilt. Move reel aft.	7.12.1 7.12.3 7.12.9
Plastic Fingers Bent Forward At Tip. **(Opposite of above)**	Reel digging into ground with reel speed faster than ground speed.		
Plastic Fingers Bent Close to Tine Tube. 	Excessive plugging at cutterbar with wads of crop accumulating at cutterbar while maintaining reel operation.	Correct plugging/cutting issues. Stop reel before plugging becomes excessive.	7.19 ---

*** See your MacDon dealer.**
**** Refer to Windrower Operator's Manual.**
***** Refer to Windrower Technical Service Manual.**

9.4 HEADER AND DRAPERS

SYMPTOM	PROBLEM	SOLUTION	SECTION
Header Lift Insufficient.	Low relief pressure.	Increase relief pressure.	**
Insufficient Draper Speed.	Speed control set too low.	Increase control setting.	7.12.6
	Relief pressure too low.	Increase relief pressure to recommended setting.	***
	Windrower header drive too slow.	Adjust to correct speed for windrower model.	**
	Worn out gear pump.	Replace pump.	***
	Pressure compensator (V7) set too low.	Adjust to increase setting.	**
Draper Will Not Drive.	Drapers are loose.	Tighten drapers.	8.8.1
	Drive or idler roller wrapped with material.	Loosen draper and clean rollers.	
	Slat or connector bar jammed by frame or material.	Loosen draper and clear obstruction.	
	Roller bearing seized.	Replace.	8.8.5.5
	Low hydraulic oil.	Fill windrower reservoir to full level.	**
	Incorrect relief setting at flow control valve.	Adjust relief setting.	***
Draper Stalling.	Material not feeding evenly off sickle.	Lower reel.	7.12.8
		Install stub guards.	* & 8.7.6 & 10.3
Hesitation In Flow Of Bulky Crop.	Header angle too flat.	Steepen header angle.	7.12.3
	Material overload on drapers.	Increase side draper speed.	7.12.6
		Install upper cross auger.	10.8
		Add flighting extensions.	*
Drapers Back-Feed.	Drapers running too slow in heavy crop.	Increase draper speed.	7.12.6
Crop Is Thrown Across Opening And Under Opposite Side Draper.	Drapers running too fast in light crop.	Reduce draper speed.	
Material Accumulates Inside Or Under Front Edge Of Draper.	Deck height improperly adjusted.	Adjust deck height.	8.8.6
Material Wrapping At Upper Cross Auger Beater Bars.	Crop conditions do not require beater bars.	Remove beater bars.	7.20

*** See your MacDon dealer.**
**** Refer to Windrower Operator's Manual.**
***** Refer to Windrower Technical Service Manual.**

SYMPTOM	PROBLEM	SOLUTION	SECTION
Material Accumulating On End Deflectors And Releasing In Bunches.	End deflectors too wide.	For headers with manual deck shift only, trim deflector or replace with narrow deflector (172381).	7.17

9.5 CUTTING EDIBLE BEANS

SYMPTOM	PROBLEM	SOLUTION	SECTION
Plants Being Stripped, and Complete Or Partial Plants Left Behind.	Header being carried off ground.	Lower header to ground and run on skid shoes and/or cutterbar.	7.12.1.2
	Float set too light - rides on high spots and does not get back down soon enough.	Set float for: 100 - 150 lbf - dry ground 50 - 100 lbf - wet ground.	7.12.2
	Reel being operated too high.	Fully retract reel cylinders.	7.12.8
	Reel too high with cylinders fully retracted.	Adjust reel height.	8.9.1
	Finger pitch not aggressive enough.	Adjust finger pitch.	7.12.10
	Reel too far back on reel support arms.	Move reel forward until the fingertips skim the soil surface with header on ground and center-link properly adjusted.	7.12.9
	Header angle too shallow.	Lengthen center-link. If cutting on ground, header angle can be increased by fully retracting lift cylinders.	7.12.3
	Reel too slow.	Adjust reel speed to be marginally faster than ground speed.	7.12.4
	Ground speed too fast.	Lower ground speed.	7.12.5
	Header skid shoes adjusted too low.	Raise skid shoes to maximum “up” position.	7.12.1.2
	Dirt packs on bottom of cutterbar and raises cutterbar off the ground.	Install plastic wear strips on bottom of cutterbar and skid shoes.	*
	Dirt packing on bottom of cutterbar with poly wear strips on cutterbar and raises cutterbar off the ground.	Ground too wet. Allow soil to dry.	---
		Manually clean the bottom of cutterbar when accumulation gets unacceptable.	

*** See your MacDon dealer.**
**** Refer to Windrower Operator’s Manual.**
***** Refer to Windrower Technical Service Manual.**

SYMPTOM	PROBLEM	SOLUTION	SECTION
Plants Being Stripped, and Complete Or Partial Plants Left Behind (Continued).	Plastic wear strip for cutterbar has been installed over top of steel wear plates.	Remove steel cutterbar wear plates when installing the plastic wear strips for cutterbar.	---
	Header not level.	Level header.	7.18
	Worn/damaged knife sections.	Replace sections or complete knife.	8.7.1, 8.7.2 & 8.7.4
	Parts of vines get caught in pointed guard tip. (Occurs more in row-cropped beans that are hilled from cultivating.)	Install stub guard kit.	10.3
Excessive Losses At Dividers.	Divider rod running down crop and shattering pods.	Remove divider rod.	7.12.11
	Vines and plants build up on endsheet.	Install divider rod.	
Plant Vines Pinched Between Top Of Draper And Cutterbar.	Cutterbar has filled up with trash with draper to cutterbar gap properly adjusted.	Raise header fully at each end of field or as required and shift decks back and forth to help clean out cutterbar.	---
	Shifting of decks with header raised does not clean out cutterbar debris.	Manually remove debris from cutterbar cavity to prevent damage to drapers.	
Crop Accumulating At Guards And Not Moving Rearward Onto Drapers.	Reel finger pitch not aggressive enough.	Increase finger aggressiveness (cam position).	7.12.10
	Reel too high relative to knife.	Re-adjust reel minimum height with cylinders fully retracted.	8.9.1.2
	Reel too far forward of cutterbar C-section.	Re-position reel.	7.12.9
Reel Shattering Pods.	Reel turning too fast.	Reduce reel speed.	7.12.4
	Bean pods are too dry.	Cut at night with heavy dew once pods have softened.	---
	Reel finger pitch not aggressive enough.	Increase finger aggressiveness (cam position).	7.12.10
	Reel too far forward of cutterbar C-section.	Re-position reel.	7.12.9

*** See your MacDon dealer.**
**** Refer to Windrower Operator's Manual.**
***** Refer to Windrower Technical Service Manual.**

SECTION 9. TROUBLESHOOTING

SYMPTOM	PROBLEM	SOLUTION	SECTION
Cutterbar Guards Breaking.	Float insufficient.	Increase float.	7.12.2
	Excessive amount of rocks in field.	Consider installing optional stub guards. Tip: Experiment with a few guards on a section of cutterbar to compare the performance of the two different styles of guards.	* & 8.7.6 & 10.3
Cutterbar Pushing Too Much Trash And Dirt.	Header too heavy.	Re-adjust float to make header lighter.	7.12.2
	Header angle too steep.	Decrease header angle with lift cylinders.	7.12.3
		Shorten the center-link.	7.12.3
	Regular guards push dirt and plug up with trash or plug up with trash and then push dirt.	Install stub guard kit.	10.3
	Improper support for header.	Install center skid shoes on header.	7.12.1.2
Cutterbar Pushing Too Much Dirt In Certain Locations For Length Of Field.	Tire tracks or row crop ridges caused by seeding or spraying operations.	Cut at angle to ridges or crop rows to allow knife and guards to clean out better.	---
	Rolling land along length of field due to cultivating.	Cut at 90° to undulations, provided knife floats across without digging in.	---
Cutterbar Fills Up With Dirt.	Excessive gap between top of front of draper and cutterbar.	Adjust front deck supports to obtain proper clearance between cutterbar and draper.	8.8.6
		Raise header fully at each end of field or as required and shift decks back and forth to help clean out cutterbar.	---
Reel Carries Over Odd Plants In Same Location.	Reel fingers (steel) bent and hook plants out of the crop flow on drapers.	Straighten fingers (steel).	---
	Dirt accumulation on end of fingers do not let plants slide off fingers over drapers.	Raise reel. Adjust reel fore and aft location to move fingers out of the ground.	7.12.8 7.12.9

***   See your MacDon dealer.**
**** Refer to Windrower Operator's Manual.**
***** Refer to Windrower Technical Service Manual.**

SYMPTOM	PROBLEM	SOLUTION	SECTION
Reel Carries Over Odd Plants In Same Location.	Reel fingers (steel) bent and hook plants out of the crop flow on drapers.	Straighten fingers (steel).	---
	Dirt accumulation on end of fingers do not let plants slide off fingers over drapers.	Raise reel. Adjust reel fore and aft location to move fingers out of the ground.	7.12.8 7.12.9
Reel Carries Over Excessive Amounts Of Plants Or Wads.	Excessive accumulation of crop on drapers (up to height of reel center tube).	Increase draper speed.	7.12.6
	Finger pitch too retarded.	Increase finger pitch.	7.12.10
Reel Wraps Up With Crop.	Reel too low.	Raise reel.	7.12.8
Reel Ends Wrap Up With Crop.	Uncut crop interfering on reel ends.	Add reel endshields.	10.9

9.6 WINDROW FORMATION

SYMPTOM	PROBLEM	SOLUTION	SECTION
Heads On Ground (Flowered Out).	Draper speed too slow.	Increase draper speed.	7.12.6
	Draper angle too flat.	Increase header angle.	7.12.3
	Ground speed too slow.	Increase ground speed.	7.12.5
	Crop too ripe.	Cut material before too mature.	---
Hollow In Center.	Draper speed too slow.	Increase draper speed.	7.12.6
	Delivery opening too wide.	Decrease delivery opening width.	7.13
Heads In Center (Too Much Herringbone).	Draper speed too fast or draper angle too steep.	Reduce draper speed and/or decrease draper angle.	7.12.6 7.12.3
	Ground speed too fast.	Reduce ground speed.	7.12.5
	Crop too green.	Allow to mature.	---
All Heads To One Side.	Crop leaning to one side and reel too slow.	Increase reel speed to re-orient crop parallel to draper slats and/or increase finger pitch aggressiveness.	7.12.4 7.12.10
Uneven Windrow (Any Crop Condition).	Ground speed too fast for drapers, causing heads to fan out and causing crop to come off draper in bunches.	Reduce ground speed or increase draper speed.	7.12.5 7.12.6
	Reel too low.	Raise reel.	7.12.8
	Reel too fast.	Reduce reel speed.	7.12.4

*** See your MacDon dealer.**
**** Refer to Windrower Operator's Manual.**
***** Refer to Windrower Technical Service Manual.**

10 OPTIONS AND ATTACHMENTS

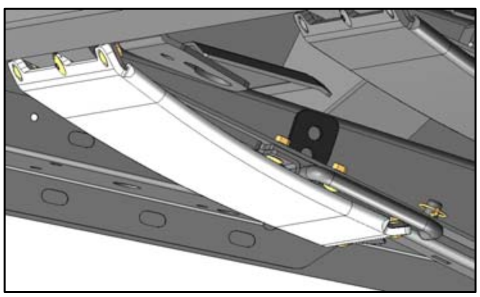
See your MacDon Dealer for availability and ordering information.

10.1 CUTTERBAR POLY



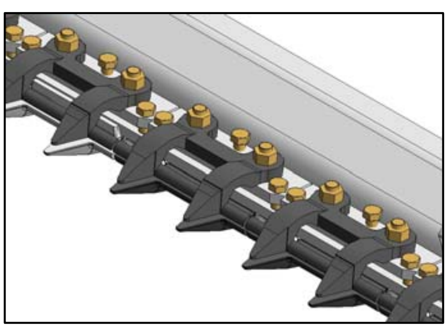
Available as an attachment for use with D50 and D60 Harvest Headers. They are recommended for cutting on the ground where the soil adheres to steel.

10.2 ADJUSTABLE SKID SHOES WITH POLY COVER



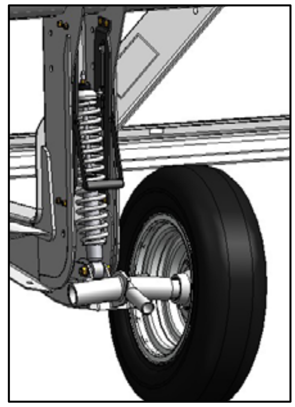
Available as an attachment for use with D50 and D60 Harvest Headers. They are recommended for cutting on the ground.

10.3 STUB GUARD CONVERSION KIT



Applicable to D60 15, 20, and 25 FT. headers. Stub guards, complete with top guides and adjuster shoes are designed to cut tough crops. The Stub Guard Conversion Kit includes installation and adjustment instructions.

10.4 STABILIZER WHEELS



Available as an attachment for use with selected sizes of D50 and D60 Harvest Headers.

The stabilizer wheels help stabilize the header in field conditions that would otherwise cause the header to bounce and result in uneven cutting height. Installation and adjustment instructions are included with the kit.

10.5 STABILIZER/TRANSPORT WHEELS



Available as an attachment for use with selected sizes of D50 and D60 Harvest Headers.

The stabilizer/transport wheels help stabilize the header in field conditions that would otherwise cause the header to bounce and result in uneven cutting height.

The wheels convert to transport mode to allow the header to be towed behind a properly configured MacDon windrower, or agricultural tractor at slow speed.

10.6 LODGED CROP REEL FINGER KIT



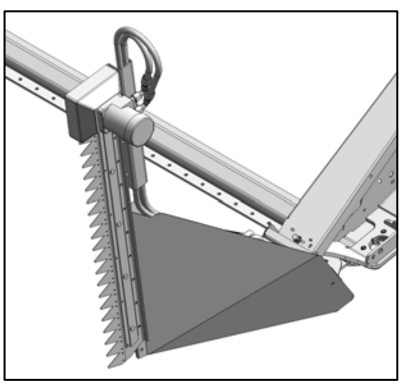
Available as an attachment for use with D50 and D60 Harvest Headers.

The steel fingers attach to ends of "every other" tine bar and help in clearing material in heavy hard to cut crops.

Two kits are required for modifying each bar of a 6-bat reel.

Installation and adjustment instructions are included with the kit.

10.7 VERTICAL KNIFE MOUNTS



The vertical knife mounts allow installation of vertically oriented sickles onto both ends of D50 and D60.

The SABRE vertical knife must be obtained from Canadian Agri Technologies. See your MacDon Dealer for further details.

Installation and adjustment instructions are included with the kit.

10.8 UPPER CROSS AUGER KIT

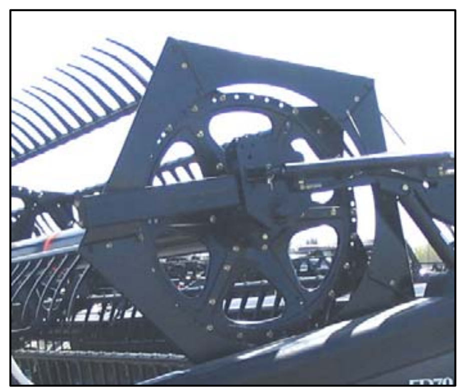


Available as an attachment for use with D50 and D60 Harvest Headers.

The cross auger helps deliver very bulky crops across the header onto the windrow.

Installation and adjustment instructions are included with the kit.

10.9 REEL ENDSHIELD KIT



Available as an attachment for use with D50 and D60 Harvest Headers.

The steel shields attach to ends of the reel and help in clearing material in heavy hard to cut crops.

Installation and adjustment instructions are included with the kit.

10.10 DOUBLE DRAPER DRIVE

Available for 25 to 40 FT. D60 headers. This option minimizes draper slipping in heavy forage crops when using the side delivery feature, by having four draper rollers powered instead of the normal two.

Installation instructions are included with the kit.

10.11 DRAPER EXTENSION KIT

This kit increases the length of each deck up to 10 inches (250 mm) into the header opening which decreases the swath width when cutting light/thin crops.

It includes roller support extensions a draper repair kit and necessary hardware. Installation instructions are included.

10.12 RICE DIVIDER KIT



Available as an attachment for use with D50 and D60 Harvest Header.

The rice dividers attach to the LH and RH endsheets, and perform the same function in tall and tangled rice crops as standard equipment crop dividers.

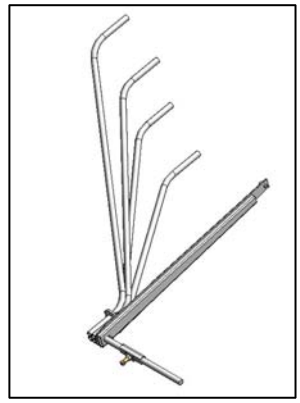
Installation and adjustment instructions are included with the kit.

10.13 KNIFE HEAD SHIELD

The shield attaches to the endsheet, and reduces the knife head opening to prevent cut crop from accumulating over the knife head, which could damage the wobble box and the endsheet.

It is recommended that the shield(s) be installed when harvesting severely lodged crop or any crop condition where the heads tend to accumulate over the knife head.

10.14 SWATH FORMING RODS



Available as an attachment for D50 and D60 Harvest Headers, and are mainly used for grass seed cutting applications.

The rods form the windrow such that the heads are in the center and thus protected from shatter.

Installation and adjustment instructions are included with the kit.

10.15 HYDRAULIC DECK SHIFT

Available as an attachment for use with selected sizes of D60 Harvest Headers.

This system allows shifting of the decks from the Operator’s console when double-swathing.

Installation and adjustment instructions are included with the kit.

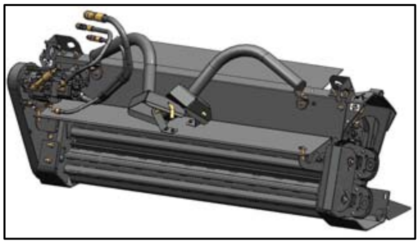
10.16 DOUBLE WINDROW ATTACHMENT



The Double Windrow Attachment (DWA) can be attached to the M Series Windrower to enable double windrowing with a hay conditioner.

The kit includes all the necessary fittings and instructions.

10.17 HAY CONDITIONER



Available for mounting on D Series Draper Headers.

The hay conditioner will lay uniform fluffy windrows. Conditioning or crimping the cut hay allows moisture release for quicker drying and earlier processing.

Installation instructions, Operator's manual, and parts list are included.

10.18 ROCK RETARDER KIT

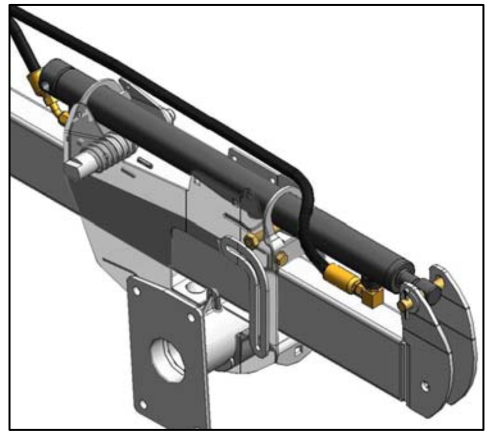


Available as an attachment for use with D50 and D60 Harvest Headers.

The rock retarder kit keeps rocks from rolling past the cutterbar and onto the drapers.

Installation and adjustment instructions are included with the kit.

10.19 HYDRAULIC REEL FORE-AFT POSITIONER



Available for headers that were not factory equipped with the hydraulic reel fore-aft option.

The hydraulic fore-aft option allows an Operator to control the reel fore-aft position from the cab.

Installation and adjustment instructions are included with the kit.

11 UNLOADING AND ASSEMBLY

Refer to header specific instruction for unloading, assembly and set-up procedures that are included with your shipment, according to the following table:

SHIPPING DESTINATION	HEADER DESCRIPTION	INSTRUCTIOAL MANUAL PART NUMBER
NORTH AMERICA	D50 and D60 Harvest Header for Self-Propelled Windrowers	169007
EXPORT		169261

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